

DOCKYARD NOTES.

A CORRESPONDENT writes to us, much exercised in mind over our having called the Italian Lepanto a first-class cruiser instead of a battleship, in December last. It is harking back some while; however, he is not the first that has charged us with heresy on this score, and because we do not incline to accept official designations as the last word. The Lepanto is not a battleship, unless the Powerful, Diadem, Hertha, Sai Yen, and a score of similar ships, are also battleships, for she is identical in design to them, or rather they are improvements on the same design. All trust to Providence to protect their water-lines, and, save for their armoured deck, have no armour beyond some about the guns. That about the big guns of the Lepanto serves no purpose at all—the guns themselves are at the mercy of a Maxim, and a few 4.7 shell could wreck their supports. The armament per se makes no difference. In a fleet action the Lepanto would very probably give out a few nasty hits, very possibly sink or disable one or two ships, but in a very short while she would be a floating wreck. Her sole chance is to get her blow in first, which might make her a good ship for a duel; but for general action her fate is certain destruction. In the present stage of naval warfare ships must be armoured, or else give action only as a last resort, and in full expectation of a Killenny-cats sort of affair.

THE same correspondent also objects to a statement of ours that the designation "armoured cruiser" is now more often than not meaningless. It is too long ago to carry on the argument at length; but it should by now be thoroughly obvious that a system whereby the Fürst Bismarck is reckoned equal to the Chiyoda is open to misconception.

THAT periodical puzzle to naval officers, the obsolete ship crusade, is on again, and the Admiralty are implored to take an example from Spain, which has recently done away with fifty ships as obsolete or useless to her. These enthusiastic advisers, however, as usual, only partially grasp the situation. In Spanish hands a Majestic or a Diadem would probably be just as obsolete as Vizcayas, Don Juan d'Austrias, Numancias, or any others. The fifty condemned vessels are condemned primarily because the cost of keeping them efficient is more than Spain can well afford. The British Empire, however, can afford to keep her old ships, and, in the opinion of most naval officers, does wisely in doing so. There is no telling what uses these old ships might not have in a war. The alternative shouted for by the Navy League—reconstruction—is not worth the candle. Apart from that, it is quite overlooked that reconstructed ships swiftly grow obsolete again. It is always a sounder policy to spend the money in new craft. But as in the old days old ships were preserved for use as fire ships, floating batteries, and so on, so in the next war circumstances may arise that will render our so-called "death traps" exceedingly valuable.

THE "old Navy" dies hard. In last Saturday's Army and Navy Gazette an "officer of wide experience" growls about the recent manœuvres. This shipmate of Noah is distracted at having seen a ship leaving harbour with her lower booms out, and at encountering men on board her with white cap covers on at 10 p.m. A mark of exclamation accentuates this last crime. From the old-school standpoint naval efficiency began and ended with this sort of thing, admirable enough in its way. Unfortunately it was these "officers of experience," now happily on the shelf, who used to throw ammunition overboard because firing spoilt the paint work. Ships exist for sterner purposes than as show objects, and it is a happy thing that the modern Navy realises it. We can make a shrewd guess at the offending ship, and venture to guess that in all essential things she was far more efficient than the pattern ship where they were so particular about cap covers.

THE Marconi system of wireless telegraphy is definitely adopted for the British Navy, and twenty-five sets have been purchased. Marconi gets a royalty of £100 a year on each. There is no question among naval men that Marconi's is not merely the best system, but the only one of value.

THE Russians have laid down, or are about to lay down, a new battleship of the Borodino type to be named the Kniza Suwaroff, after the famous general. Another ship, whether of the Retvisan or Peresviet type is not quite clear, is vaguely projected at Windau.

THE 32-knot destroyer Albatross is to be commissioned at Chatham for the instructional flotilla.

A NEW coaling point is to be constructed at Portsmouth—not before it was wanted. It will be on the Gosport side, and is designed to be of use—a feature lacking in the present point, which is too small to be of much service.

FROM the current Le Yacht we glean that the Revenge, repairing at Chatham, and the Hood, are to be re-armed with quick-firers.

THE new United States submarines will be a trifle larger than the Holland. They are to be named Adder, Grampus, Mocassin, Pike, Porpoise, and Shark. With some of the names there is that poetical appropriateness characteristic of American ship names—but why Mocassin?

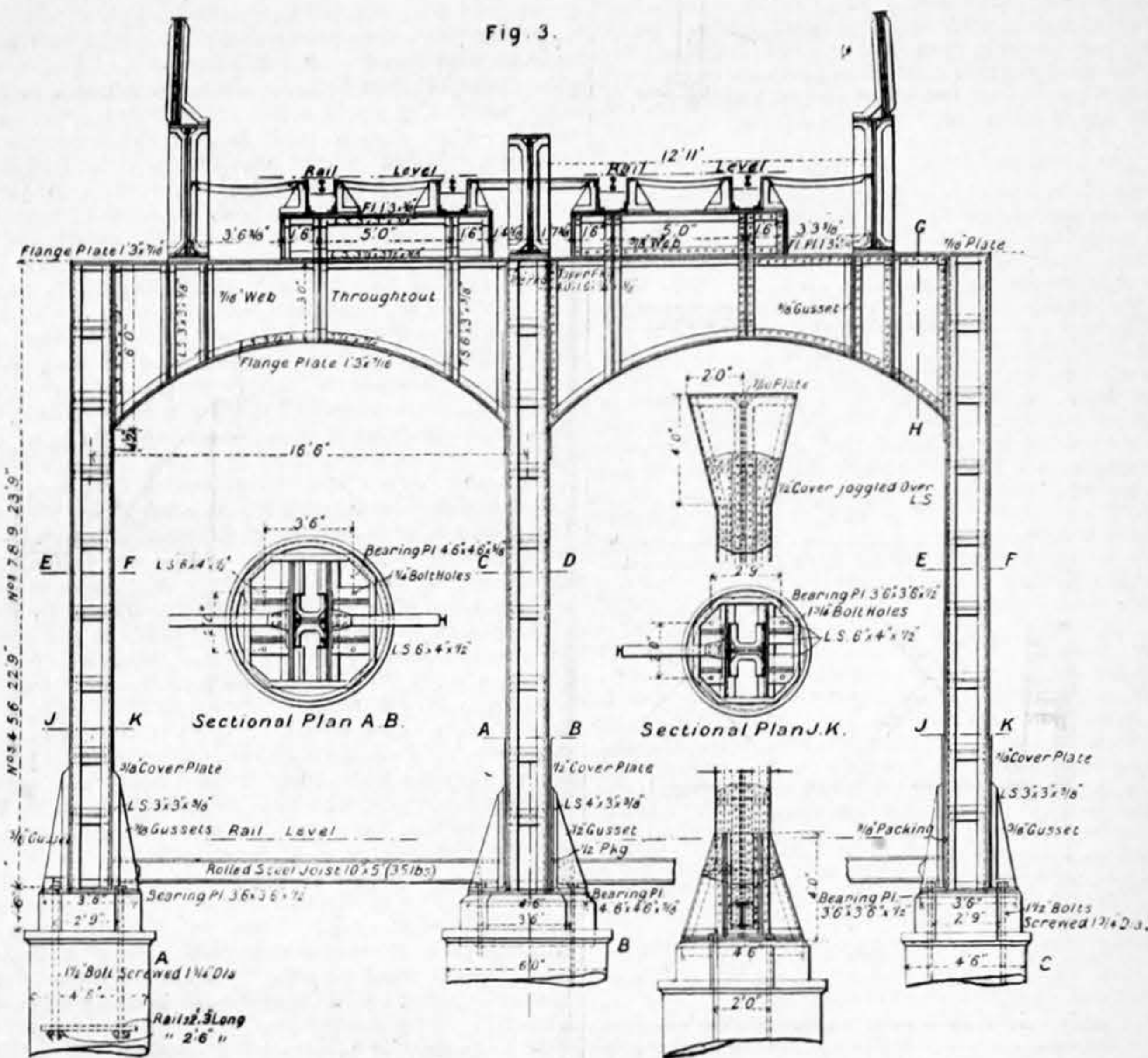
MUCH has been written on the important subject of utilising blast furnace slag, and, according to Mr. R. C. von Schwarz, the gradual enlargement of blast furnaces has considerably increased the quantity of this product. Its chief use now is in the manufacture of cement, and Mr. Schwarz, after setting forth the details of manufacture, gives the following as an analysis of the finished slag cement:—Loss on ignition, 5.70 per cent.; silica, 23.70; lime, 59.08; alumina, 6.14; ferric oxide, 1.80; magnesia, 1.40; sulphuric acid, 1.30. Slag cement is distinguished by its exceptional high strength of compression and tensile strength, especially after a longer period of hardening. For instance, a mixture of 1 part of cement with 3 parts of sand showed tensile strength after 28 days, 282 lb. to 370 lb. per square inch; strength of compression, 2560 lb. to 2920 lb. per square inch; tensile strength after 360 days, 538 lb. to 700 lb. strength of compression, 4260 lb. to 5760 lb.

GREAT NORTHERN RAILWAY.—NEW RAILWAY AT NOTTINGHAM.

By R. F. BENNETT, Construction Department, G.N.R. No. II.

FOLLOWING the arches last described in our issue of the 17th inst., is an important steel structure called the Gasworks Viaduct, consisting of nineteen spans of 51ft. each, carried on steel stanchions, which are supported on cast iron cylinders filled with cement concrete and carried down to the sandstone rock. This type of structure was necessitated by the narrow spaces within which the supports had to be carried; this space was confined on one

Dealing with the former portion first, three cylinders were employed, the centre cylinder being 6ft. in diameter, and the two outer 4ft. 6in. in diameter; they were of cast iron, and are partly shown on drawing Fig. 3. They have inner flanges 3in. wide, for bolting the different lengths together. The cutting edge was cast with the bottom length, and was 2in. thick at the widest point. The different lengths were attached together by twelve 1in. bolts. The metal, in both the 6ft. and 4ft. 6in. cylinders, was 1½in. in thickness. The bottom lengths of the cylinders were cast 5ft. long, the remainder being in 5ft. lengths, with the exception of the top lengths, which were cast to the length required, when the cylinder had reached its final bed.

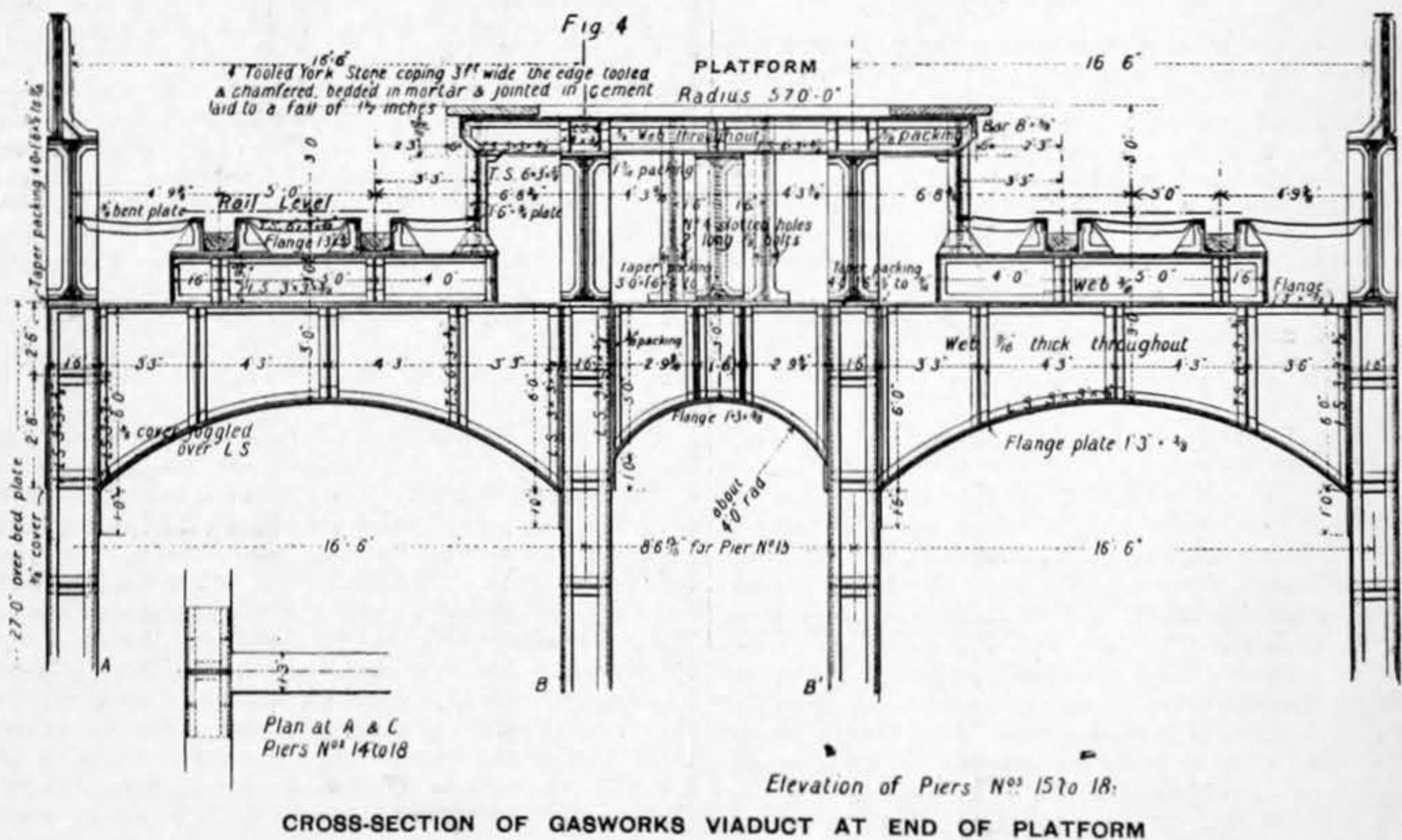


GASWORKS VIADUCT—STANCHIONS, &c.

side by the Nottingham Canal and on the other side by the Nottingham Corporation Gasworks, and was occupied by the sidings which are used for the coal wagons required for the gasworks. It was one of the stipulations that these sidings were not only to be maintained, but were not to be stopped during the construction of the works; it was impossible, therefore, to build the usual brick piers, as there was no room between the sidings to construct them, and it was therefore necessary to employ such small piers as could be got in a 12ft. space.

The type of structure employed is analogous to that used on the Liverpool Overhead Railway, but of a stronger type, as it had to carry the heavier locomotives used on the railways. The maintenance and rearrangement of the

Preparatory to sinking the cylinders four pies were driven four-square and properly strutted. The cylinders were then pitched between two guides and the excavation commenced, the earth being taken from inside under the cutting edge of the cylinder. The latter was then weighted and sunk as far as the excavation would permit. This process was again repeated until the cylinders were sunk down to the water-bearing strata. Steam pumps were then fixed, and the cylinders carried to a further depth until the water overmastered the pumps. It was then necessary to proceed with the sinking under air pressure. An air lock was bolted to the top length of the cylinders and attached to a small portable air-compressing engine, and sufficient pressure was applied to drive the water out of the cylinders. The excava-



CROSS-SECTION OF GASWORKS VIADUCT AT END OF PLATFORM

sidings under the viaduct was a matter of great difficulty and expense, as the gasworks manager could not allow any of them to be stopped for any length of time. The sidings also necessitated the irregular spacing of the supports, which could not be put in line, as they had to be placed between the sidings where possible, consequently it was impossible to place the columns under the main girders, and heavy connecting girders had to be put at the top of the stanchions to take the weight of the main girders, which in many cases came upon them. It was also necessary to arrange the cylinders in two different systems, for at the commencement only two lines had to be carried above, but the west end of the viaduct had also to carry the platform of the new London-road Station, and therefore these two lines spread out to allow of an island platform being placed between.

tion was then proceeded with, the gravel and earth being passed through the air lock in the usual way until the cylinders reached the sandstone rock, which was levelled until the cutting edge rested all round on a firm foundation. Upon this being obtained the cylinders were filled in with cement concrete—in the proportion of five of gravel and sand to one of cement—to within 4ft. of the top, when the concrete was brought to a level surface, and short lengths of old rails were put in the form of a square, the bottom two rails being 4ft. 9in. long and the others 4ft. long. These rails were drilled at the point of intersection where they crossed each other for 1½in. bolts. These bolts were screwed for 1½in., and passed through the rails and fastened on the underside. The bolts were fixed vertically and temporarily to a square template above the ground level, and were then

GREAT NORTHERN RAILWAY-EXTENSION AT NOTTINGHAM-BRIDGE OVER THE CANAL BASIN

(For description see page 218)

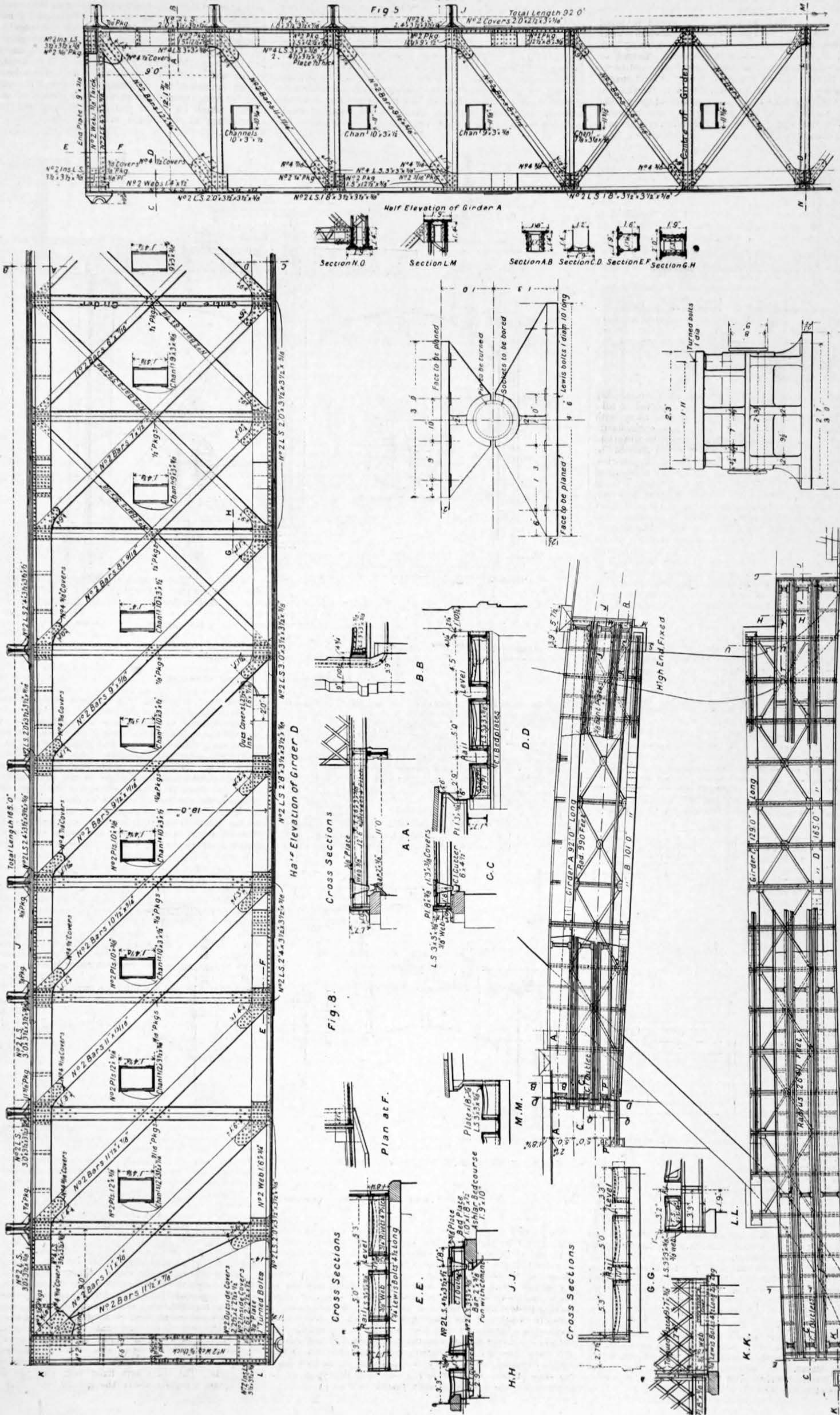


FIG. 9-FIXED BEARING

SWAIN ENG.

