

NEW ARCH CENTRES.

In the construction of masonry arches and vaults, it is not always possible to erect ordinary centres, as when the arch is near the surface of water. A writer in the *Annales des Ponts et Chaussées* illustrates two kinds of false-work, which have special features, and have been used at Bordeaux. The contractors supported the masonry upon a cylindrical platform or lagging of iron plates about $3\frac{1}{4}$ in. thick, suspended from three pairs of lattice arched girders above, and clear of the arch of masonry. At equal distances on panel points, 2 in. suspended rods ran down through the vault lagging and cross beams, supported from screw nuts on plates across the tops of girders. These rods passed through holes cut in the arch stones, normal to the intrados. The centres were easily removed by unscrewing the nuts from the lower end of the suspending rods. The *Engineering Record*, which describes this system of centering, illustrates the plan by elevations and cross-sections of the plan. Another method is also illustrated, in which the intrados of the arch of masonry are carried by iron lattice-girders below the soffit in the usual position of

centres. Six girders were framed together, though each acted as a simple truss instead of an arch. The two trusses at each end were connected and incased by iron plates, and formed two four-sided or rectangular water-tight caissons of cylindrical curve to suit the arch. These floated the whole false-work into position at high water. They, in fact, formed two caissons of the depth of the arch, and of its whole width, segmental in form, corresponding to the arch, connected together, and having between them the other trusses. The straight iron girders were inserted in the masonry piers, and the trusses were landed upon them and made stable by admitting water through valves. The vault was then built, and the centres were afterwards struck by slacking the screws in the usual way. The first-described method is really an overhead centre, by means of which the real masonry arch is suspended, while the second plan is really a floating centre below the arch to be constructed, the ends being floated into position, and the centering and lagging constructed between them. Both plans are ingenious methods of forming centres for bridge vaults which are too close to the water surface to admit of the usual plan being used.

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