

## The Fragnée bridge in Liège [1904 – 1940, 1948 - today]

(Braham Marc ; September 2020, V02\_October 2020, V03\_January 2021, V04\_June 2021)

Warning: even if the Fragnée bridge in Liège is well known and widely documented, it is obvious that it must also be described in our website, it has its place there. In this context, what follows is largely inspired by two publications, which, in view of their origin, appear to be trustworthy: an article in the *Cahier du MET*<sup>2</sup> no. 9 (1994), and another in the *Cahier de la Fonderie* no. 23 (1997), both written by Muriel Michels. The few geometric dimensions given here come however from the drawings in the SPW<sup>3</sup> database. The various documents consulted do indeed show some differences, small perhaps, but very real.

**Location :** Liège.

50°37'15.41"N ; 5°34'46.83"E.

**Construction**<sup>2</sup> : first bridge : 1902-1904 ;

second bridge : 1946-1948.

**Inauguration** : first bridge<sup>2</sup> : 26<sup>th</sup> of July 1904 ;

second bridge<sup>1,2</sup> : 4<sup>th</sup> of November 1948

**Current condition** : in use, perfect condition.

**Manufacturer** : S.A. John Cockerill for both bridges.

**Builder** : S.A. John Cockerill (Liège) ; A. Janssens (Hoboken).

**Purpose** : crossing of the Meuse river, initially a kind of royal mile leading to the 1905 Universal and International Exhibition.

**Description in length**<sup>3</sup> : for both bridges :

Total length 177,75 m for 3 spans of 53,775, 57,80 and 53,775 m between the hinge axis at the arch supports.

**Description in width**<sup>1,2</sup> :

First bridge : 16,00 m for 10,00 m roadway and 2 walkways of 3,00 m.

Second bridge: 17,20 m for 12,00 m roadway and 2 walkways of 2,60 m.

**Weight of the metal part**<sup>2</sup> : 1810 tons for the first bridge<sup>2</sup>, and 2230 tons for the second<sup>1</sup>.

**Particularity** : one of 3 bridges, the most important, the most impressive, built for the 1905 Universal and International Exhibition in Liège. Destroyed in 1940, it is however rebuilt to its identical in 1948.

**Classification** : to the Wallonia Region real estate heritage on March 14<sup>th</sup> 1994 ; to the Wallonia Region exceptional heritage in 2013.



Fig. 1 : The Fragnée bridge (photo M. Braham, June 2020)

The Fragnée bridge, as it was designed and as it can still be seen today, certainly owes everything to the Universal and International Exhibition in Liège in 1905. And yet, according to Drèze<sup>4</sup>, this exhibition seems to have started as a sort of joke: in fact, in May and June 1897, a Liège daily newspaper publishes unsigned articles suggesting that such an exhibition is planned; it bases its allegations on an informal conversation between two members of the *Cercle privé du Commerce de Liège*<sup>4</sup>, whom it however does not name. But then things progress very quickly. A meeting of a provisional committee on 21 June breaks the secret of the upcoming project<sup>4</sup>. A *Promotional Committee* is created on 21 June, a *Propaganda Committee* on 6 January 1898, a *Study Society* is set up on 26 June 1898, and finally a *Technical Committee* is created on 15 March, which submits a decisive report on 25 January 1899<sup>4</sup>. The most important point of this report is its recommendation for the location of the Exhibition: the Aguesses island (*île des Aguesses*) in the *Vennes* district, provided that this decision would be accompanied by a series of major works designed to make this place suitable for the Exhibition. This includes the construction of a bridge over the Meuse river, the future Fragnée bridge (we will not mention the rest of these works, which can be found under Drèze<sup>4</sup> and many other authors).

This bridge is supposed to be the entrance - monumental, must it be said? - to the Liège Exhibition. However, it is said to be inspired by the Alexandre III bridge built in Paris for the 1900 Exhibition. Well, this does not detract from its splendor. The technical design of the bridge is the work of **Émile Jacquemin**, principal engineer of the Roads and Bridges Administration (Ponts et Chaussées) in Liège, and the conception of the decoration comes from the architect **Paul Demany** [1859-1912], considered a reference in Liège. Demany is responsible for the architecture of the bridge's masonry, but also for its ornamentation (railings, candelabras, etc.) and for the study of the statues making up its allegorical decoration<sup>5</sup>.

### The construction of the bridge and its foundations.

The tender for the construction of the abutments and piers is won by the contractors Joseph and Victor Cousin (first commissioning on 4 October 1901). The foundations are executed using a system of caissons with compressed air, which is not very common in Belgium, but which has been used for that famous Alexandre III bridge, as well as for the Eiffel Tower.

The said caisson is here a steel parallelepiped, 27.4 m long and 8 m wide (Fig. 2). It is 3.75 m high but has no bottom, only a reinforced and watertight intermediate floor and sharp lower edges. The caisson is lowered to the riverbed, the lower chamber is pressurized to prevent water from entering and by that allowing the workers to work in it. They remove the sediments from the riverbed, which are hauled up through the access chimneys. The upper chamber is filled with concrete and this ballasting has the effect of gradually sinking the caisson until stable ground is reached. Once the caisson is "in place", its lower chamber is filled with concrete and the bridge pier can be built on top of it.

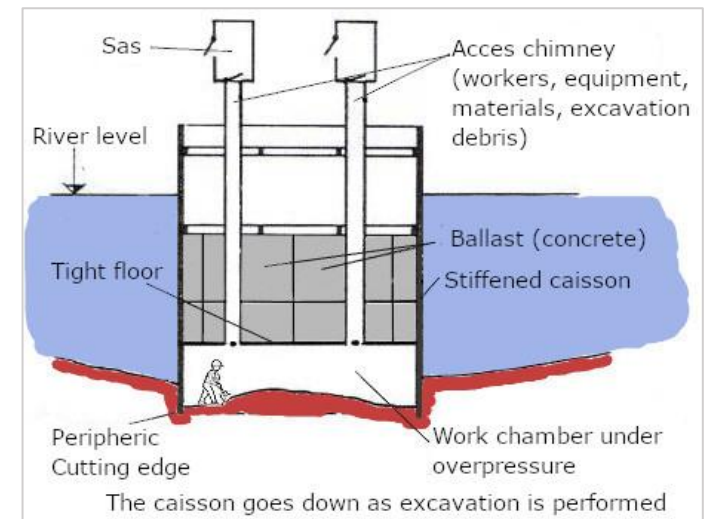


Fig. 2 : working principle of the compressed air caisson

The construction of the metal part is commissioned to the John Cockerill company on 16 January 1903. Of course, it is this company that also manufactures its elements. They are brought to the job site piece by piece, and assembled in place by riveting, using scaffoldings equipped with wooden arches, as is done for stone vaults. The assembly is completed on 12 March 1904.

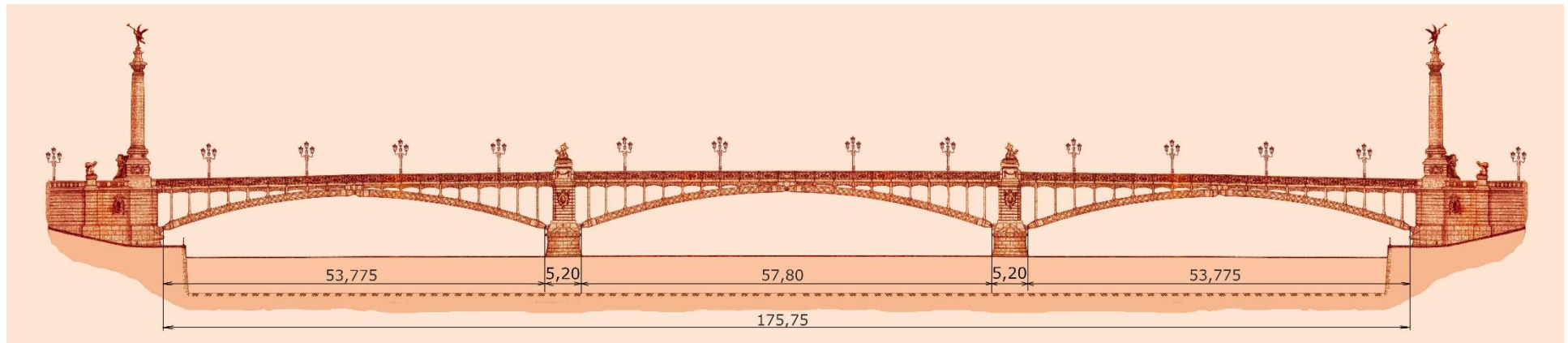


Fig. 3 : Side elevation view of the Fragnée bridge

The steel structure consists of 3 arches with spans of 53.775, 57.80 and 53.775 m between their supports (Fig. 3). The arches are each composed of 6 low arches executed as trusses and with 3 pinned joints, 2.68 m apart (Fig. 4\*). The arch height is 5.07 m for the side arches, and 5.61 m for the central one. The bridge is overall slightly humpbacked, with a height of 1.10 m. The width of the bridge is 16.00 m between the railing axes, including a 10.00 m carriageway and two 3.00 m walkways which rest partially on brackets. The deck is also metallic (Fig. 4\*), its upper surface is covered with embossed metallic plates which carry the aggregates and materials making up the roadway and the walkways. It is supported by posts that transfer the loads to the arches. All the metal parts are assembled by riveting.

\* Note : figure 4 concerns the actual bridge ; figures 5 and 6 are of course actual fotos also; but the actual situation, after the 1948 reconstruction, has however maintained the original layout and concept.

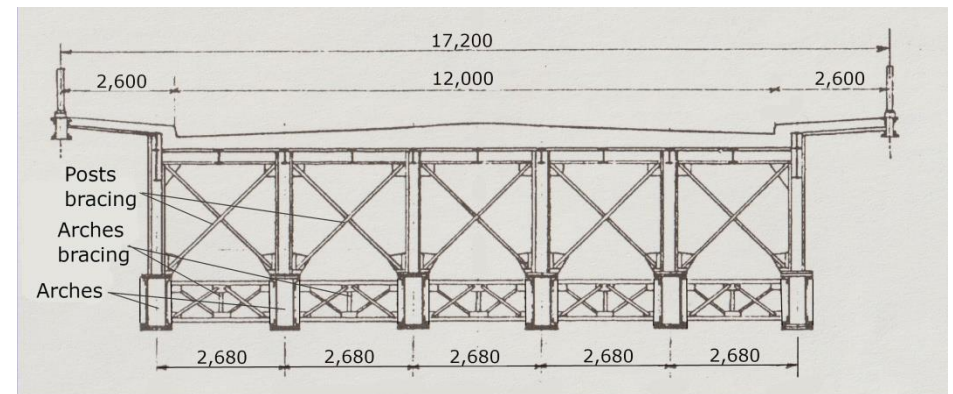
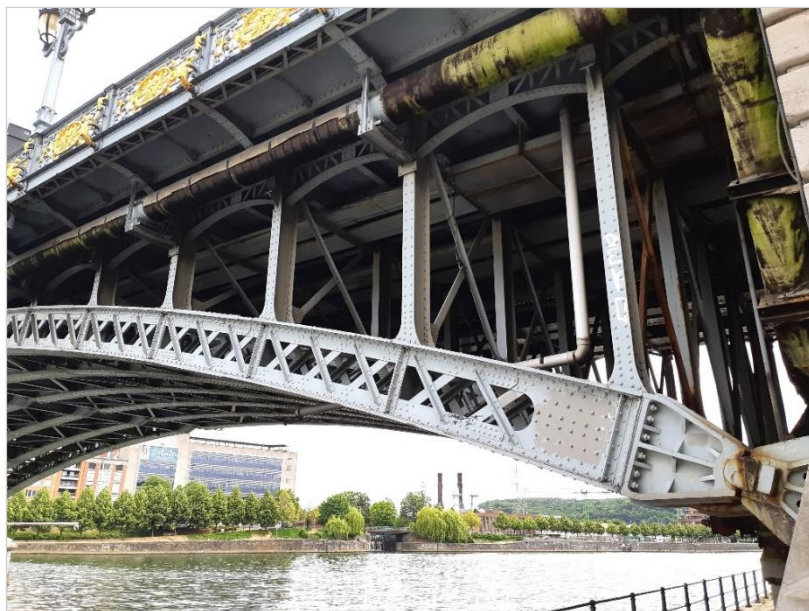


Fig. 4 : transverse cut through the new bridge (1948)



The arches consist of curved box beams which have a height of around 1.00 m. Their flanges are made of several stacked plates of about 800 mm width, but the webs are not plain; they are made of T-bars arranged in successive crosses along the length of the arches (Fig. 5). The arches are braced at each post, between each other by means of lattice girders (Figs. 4 and 6)\*, and towards the deck by means of vertical crosses (Figs. 4 and 5)\*. They are also braced in the curved surface of the arches (Fig. 6).



Figs. 5 and 6 : bracings between the sub-arches of the bridge arches (fotos M. Braham, June 2020)

**The bridge decoration** (the following text is inspired by, and even partially copied from the publications<sup>2,5</sup> by Muriel Michels)

The decoration of the bridge is the work of the Liège architect Paul Demany (1859-1912), duly commissioned by the government for this purpose. First of all, it concerns the masonry of the structure. The concerned masonry includes the breakwaters of the pillars above the arch bases, the impressive pylons and their bases at the four corners of the bridge (Fig. 13), the balconies and the walls returning from the abutments. The execution drawings are drawn up by the bridge design engineer Jacquemin, in accordance with the projects provided by the architect Demany.

In addition to the masonry, Demany is responsible for the design of the statues that make up the allegorical decoration of the bridge. The latter, bronze round-bosses, are created by the feluysian sculptor Victor Rousseau [1865-1954]. They consist of four Fames (*Renommées*) gilded in fine gold and supported by the pylons (Fig. 13), four allegorical figures leaning against the pylons, representing the Old River (male) and the New River

(female), and eight Tritons mounted on the pedestals (Fig. 12) that crown the breakwaters of the piers and on those standing out of the walls in return from the abutments.

Demany is also responsible for the utilitarian elements, the railings (Figs. 7 and 8) and the candelabras (Fig. 7), which have an ornamental character. The railings are composed of wrought iron frames in which are placed openwork panels in cast and then gilded bronze, with a decoration of acanthus leaves with curved stems, and a mascarón, a radiating face in an oval, alternately male and female. The railings are maintained by buttresses outside the bridge made of wrought iron lined with gilded bronze acanthus leaves (not visible on the detail photos, but on Fig.1).



Figs. 7 and 8 : The railings, a candelabra and a Triton of the Fragnée bridge (fotos M. Braham ; June 2020)

The cast-iron candelabras are integrated into the railings (Fig. 7): situated in their plane, they extend some of the cast-iron vertical uprights at a rate of 4 pieces (and not 3 as is sometimes reported) per span, on each side of the bridge (Fig. 3). Like the railings, they are made up of an underlying metal structure onto which gilded bronze ornaments are attached. The *Compagnie des Bronzes de Bruxelles* is awarded the contract to execute the railings and candelabras. Curiously enough, the *Compagnie* subcontracts the cast-iron elements to the *Fonderie d'Ornements J.G. Requilé et Fils* of Liège<sup>5</sup>, while it produces the bronze ornaments itself.



Demany is said to have taken inspiration from the Alexandre III bridge in Paris, which was inaugurated in 1900 on the occasion of the Universal and International Exhibition. It is certain that this Exhibition, and its famous bridge, had a major outreach at the time, and it is possible that we can find here the reason for the government's requirement served on Demany to foresee pylons at the four corners of the structure (Fig. 13).

### The Second World War.

The Fragnée bridge escapes intact from the First World War. This is not the case in the Second World War. On 11 May 1940 the bridge is blown up by Belgian troops in order to slow down the progress of the invader through the country. Many bridges in Belgium suffer the same fate on the same day: a famous firework, ... of bad taste! But the Fragnée bridge is completely destroyed. The 3 metal spans, broken in their middle, fall miserably into the river (Fig. 9). The Tritons at the pier heads are also thrown in, as are the candelabras. However, the Meuse piers and the abutments with their attributes, columns and Fames and other sculptures are intact (Fig. 9). A metal footbridge (or bridge, it is difficult to find precise information on this structure) is erected slightly upstream of the destroyed bridge (Fig. 10), probably as early as 1940<sup>8</sup>. On Fig. 10 can be seen, in front of the temporary truss bridge, the pier bases of the destroyed bridge on either side of the jetty separating the Meuse from its side arm (*Dérivation*); and in the background, the *Val-Benoît bridge*, the second metal bridge of that name (see article 33).



Fig. 9 : The ruins of the Fragnée bridge in 1940  
(postcard Éd. Phototypie Légia, Liège)



Fig. 10 : The temporary footbridge and the pier bases  
of the destroyed bridge (extract from *cahier du MET*<sup>8</sup>)

## The reconstruction of the Fragnée bridge.

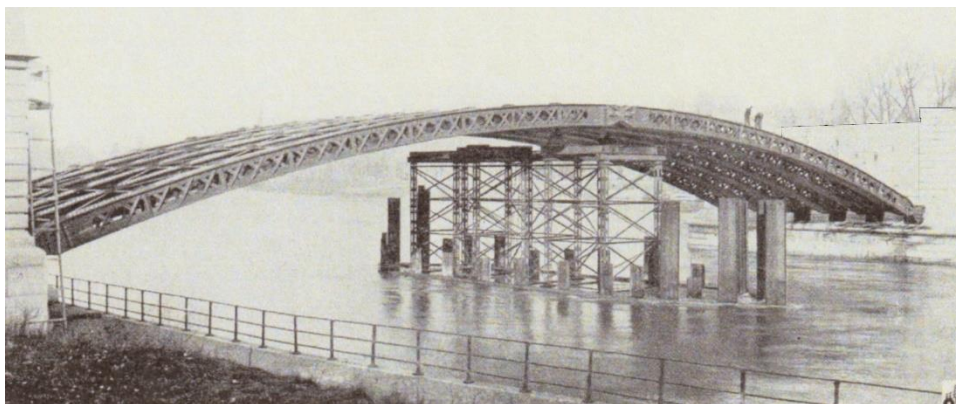


Fig. 11 : Erection of the new bridge's arches  
(extract from *L'Ossature métallique*<sup>1</sup>)

by ship. For their installation, only one single temporary support in the river is required (Fig. 11). Once the arches of one span are in place, the posts, the braces and the decking of the corresponding span are built on top. The on-site assembly is executed by the firm *A. Janssens* from Hoboken. All parts are again assembled by riveting.

The original decoration is restored as far as possible, but the candelabras are omitted as they are considered too expensive. They are replaced by roadside type poles, foreseen to serve for the lighting and at the same time to support the tramway's electric lines (only two per span of the bridge). The railing frames are reconstructed from both recovered and new elements. The bronzes that decorate them are all newly cast by the *Ateliers Dehin Frères* in Liège. The bronze alloy used has a color tone close to that of 24-carat gold. The statues, thus the tritons, are lifted from the water and stored in a safe place, but they are not put back on their pedestal until 1959. The new bridge is inaugurated on 4 November 1948.

### Some interventions worth mentioning<sup>2</sup>

As we have just written, the "Triton" statues, rescued from the water after the war, are put back in place in 1959. The opportunity was taken to complete the decoration of their pedestals (Fig. 12). In 1969, the metal parts of the bridge are repainted, accompanied by a beforehand paint stripping.

The reconstruction work begins in 1946. The design and construction of the new structure is entrusted by the Roads and Bridges Administration to the *John Cockerill* company. At the time, there is no doubt that the Fragnée bridge deserves to be rebuilt identically. The main dimensions of the structure are kept, a little forced since the piers and abutments already exist. However, the width is increased to 17.20 m instead of the 16.00 m of the original bridge. The overhang of the walkways is thus increased. However, the method of construction is quite different: whereas in the original structure the arches were built in situ, on wooden support arches, as is done for stone vaults, the half-arches of the arches are now assembled in the factory in Seraing and brought to the job site

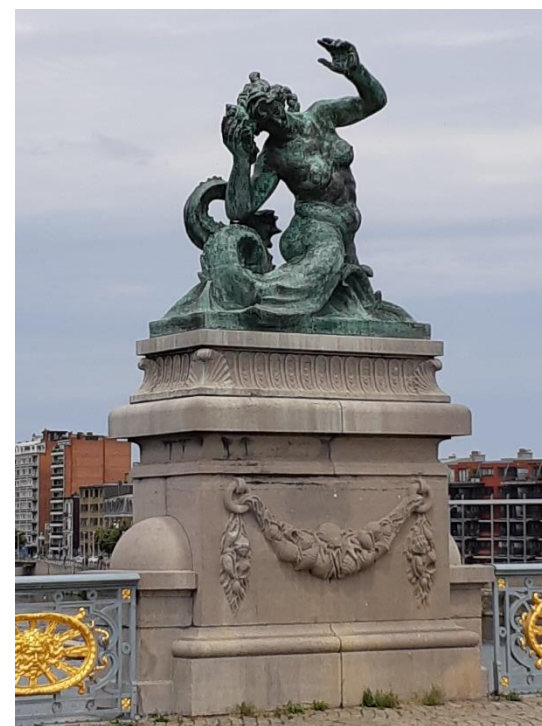


Fig. 12 : One of the « Triton » statues  
(foto M. Braham, June 2020)



## The restoration at the eave of the XXIst century



Fig. 13 : The pylons and the « Fames »  
(*Renommées*) (foto M. Braham, juin 2020)

From 1993 to 2001, the bridge is the subject of a vast restoration campaign: renewal of the roadway, stripping and repainting of the metal structure and restoring the appearance of the original decoration. In that context, very special attention is being paid to the color hue of the paintwork on all the bridge elements, including the framework. The aim is to come back as far as possible to the original colors.

The unsightly lighting posts installed during the reconstruction are transformed to restore the majestic effect of the 1905 luminaires. Integrated into the balustrade like the 1905 candelabras, they have a similar ornament at their base. A considerable additional advantage is that they are of course already supplied with electricity. They are adapted, notably shortened, to match the size of the statues (about 5 meters). Unfortunately, there are only two per span instead of the original four. The Liège-based craft company *Menchior et fils*, ornamental sculptors, is commissioned to sculpt the plaster models of the pieces that are to be placed onto the posts. This work is based on iconographic sources, as nothing remained of the original candelabras. These models are used to create the moulds for the pieces to be cast.

The bronzes of the railings are dismantled and cleaned to restore their golden appearance. Particular attention is paid to a protective coating that would maintain the special appearance of the bronze over time.

The removal of the tram rails also dates from this period. It is worth remembering that they have been a real danger, especially for cyclists. The condition of the roadway was also often questioned, for example in the context of a serious traffic accident on 1 December 1991.

Now renovated, the Fragnée bridge once again fully justifies the pride that the people of Liège take in it.





Fig. 14 : The Fragnée bridge today (foto M. Braham, June 2020)

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