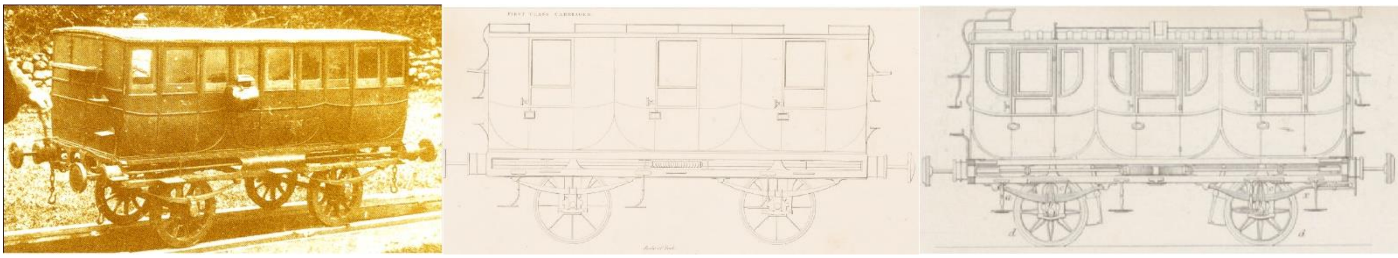
The First London & Birmingham 1st Class Carriages

By Tom Nicholls

Back on the Liverpool & Manchester Railway between 1829-1835 The Worsdells were working out of Crown Street. During 1836 Thomas Clarke Worsdell (II) was preparing to leave for Germany and Nathaniel Worsdell was building carriages for the Grand Junction Railway. It would appear that the GJR rented at least part of Crown Street.

This is important, as I hope to show, there is a direct line of development of the Liverpool & Manchester carriages of 1834, the Worsdell pattern coach, built for the London & Birmingham at the end of 1835, and GJR firsts of early 1836. The London & Birmingham were effectively copies with minor alterations of the Grand Junction carriages.



The pattern model carriage (left) built at Crown Street at the end of 1835, attributed to George Worsdell, was based on 'Liverpool best practice', submitted for the London & Birmingham's competition. The specification drawing (middle) is titled London & Birmingham but comes essentially from the same source as the pattern carriage, Crown Street, the specification being derived from Nathaniel Worsdell working with Joseph Wright basing it upon the GJR firsts that the former was building. The most likely form of the first London & Birmingham 1st class carriage (right) as drawn by SC Brees.

Joseph Wright consulted with the Worsdells regarding the first carriage design. While Thomas Clarke (II) made some suggestions to the London & Birmingham Board it would appear that Nathaniel was Wright's main contact. What initially was produced would appear to be a direct copy of the GJR First Class railway carriage.[1]

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[1] Non resident Engineers Minutes copy of letter from W Rathbone, Liverpool 12th September 1836 "1st The ordinary first Class carriages with six inside bodies. Of these the [London & Birmingham] Company has ordered 25 with and 25 without side lights**, on the Grand Junction Specification** [a], and we are not disposed to urge further ordered at present

Meeting of the Sub Committee for Carriages, 1st Oct 1836 "That Mr Wright be requested to as early as possible to Liverpool for the **purpose of preparing the necessary plans and specification in concert with Mr Worsdell Junior** and under the immediate superintendence of the Members of the Carriage Committee in Liverpool and that the Secretary be desire to furnish Mr Wright with the requisite instructions_______"

Meeting of the Sub Committee for Carriages, 19th Oct 1836, "Mr Wright attended the Committee and with reference to Minute 27 laid on the table Draft Specifications of railway Carriages as prepared by him in conformity with the suggestions of the Members of the Carriage Committee at Liverpool and ***with the assistance of Mr Worsdell junior*** namely,

Meeting of the Sub Committee for Carriages, 2nd Nov 1836 "The Secretary stated that Messrs Wright & Horne ***in following the dimensions of the Grand Junction Carriage*** had provided axles for a portion of the Coaches of their first Contract of 2 ¼ inches diameter instead of 2 5/8 inches the dimensions given in the Specification."

Meeting of the Non resident directors, Newton 4th November 1837 "Letter from Mr N. Worsdell applying for £54.8.8 expenses incurred in journeys to London, Birmingham & Lancaster for the purpose **of superintending and giving instructions with respect to the carriages built for the London & Birmingham Company**…."

Wright made some minor alterations during the construction of his first contract but was made to stick to the specification. George Aitchison (Senior) who would later be known as architect of the London & Birmingham's intermediate stations was sent to make observations of the carriages and wrote a detailed report which has been recorded in the company minutes.

Wright initially built two lots of 25 first class carriages. At this time he was in a short lived partnership with Horne, who I believe would subsequently be the Horne of Chaplin & Horne. Presumably both known to Wright through their coaching activities.

A curious story is that Wright had premises at Gough Street just around the corner from Euston to which he referred to as the 'Royal Mail Coach factory', as he has still building Royal Mail Coaches, also at Fleet Lane but also at Osnaburgh Street. The latter was the location of the carriage building. In what I think is quite extra-ordinary Wright & Horne were instructed to 'assign' their lease to the company and 'That a Servant of the Company be placed in possession and that "London & Birmingham Carriage Depot" be painted on a conspicuous part of the premises.' Whether this happened or not I don't know. Wright & Horne disbanded after the First Class contracts although Wright went on to construct a good number of the London & Birmingham Carriages.

Worsdell's Liverpool & Manchester Model for the London & Birmingham Railway

In a manner indicative of the times and reminiscent of the Rainhill Trials in terms of open competition, the London & Birmingham Railway Board advertised for 'models and drawings'. The Company Minutes reveal the known fact that The Worsdells' model was approved [2]. The reference to the Great Western Railway goes back to when it was thought the two companies would work in partnership and share Euston.

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2 From London & Birmingham Railway, London Committee, Birmingham Committee, and Board of Directors

5th Nov 1835, Minutes 185, 186, "Resolved, That the advertisement now on the Table offering premiums for models or drawings of Railway Carriages be approved________ "Ordered, That the advertisements be inserted immediately, in the London and Provincial Papers____"

10th February 1836, Minute 13 "Schedule of Plans and Models of Locomotive Carriages with reference to Min 8

"822 Ordered, That the secretary be instructed to prepare a Schedule of the several models and Plans so deposited and to forward copies there of to the Birmingham Committee, Non-resident Directors and the Secretary of the Great Western Railway Company, __"

17th February 1836, Minute 208 "Resolved, That the Directors of the Great Western Company, be requested to appoint a Committee to meet a Committee of Five Directors from this Company to decide on the Model or Plan of Railway Carriage to which the Premium offered by the two companies is to be awarded adopting for that purpose such measured as they may jointly deem expedients.

That Mr ( ) Ledsam, Mr Calvert, Mr Grenfell, Mr Prevost (sp.) and Mr Rathbone be a Committee from this Company and that they be requested to report as to the form of Carriage which they would recommend for adoption__________ "

5th August 1836 "The Committee appointed 17th February 1836 by Minute 208 of the Board to meet a Committee of Five Directors of the Great Western Railway Company to decide on the models or drawings of Railway Carriages to which the premiums of £200 and £100 offered by the two companies are to be awarded, report. That the Great Western Railway Company have not appointed such Committee, That this Committee have examined models and drawings some of complete Carriages, others only of parts of Carriages;

That this Committee have found the most approved plan to be No.,2 Mr Worsdell's being a perfect model of the best Liverpool and Manchester Carriages, with some improvements and considering the cost of that Model, they recommend it as deserving the premium of £200, including therein the purchase of the model,

That although Mr Bergin has not shown the adaption of his principle to first Class Carriages, this Committee recommend his model No.13 as deserving half the premium of "100 for an ingenious application of spiral springs to the hanging of Carriages, and that the other half of this premium be awarded to Mr George Morton for his Model No.5, although from the peculiar circumstances of this Railway they are not prepared to recommend the adoption of either of these plans at present,

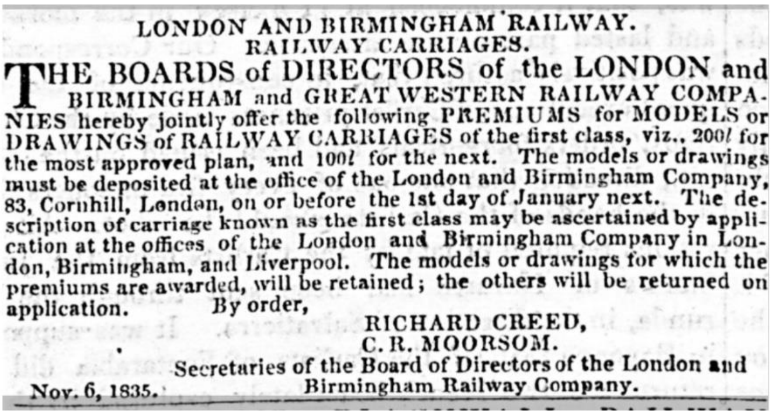
The Committee recommend that an application be made to the Great Western Company for their concurrence in the above and for the sum of £150 ___"

17th August, 1836, London Committee

"The Secretary reported with reference to Minute 264 of the Board that he had received £150 from the Great Western Company for their moiety of the premium offered for models of Carriages and that the parties who had deposited"

The competition gave rise to some surprises in terms of submissions; some of the unusual practices, for example Bergin's single central buffer, hailed as the future of buffering, didn't quite become that, but was certainly the inspiration behind the use spiral springs later on.

Worsell's carriage No.2 in the competition is believed to be one and the same as that pictured above and below but the no such record has been made of George Morton's carriage No. 5.



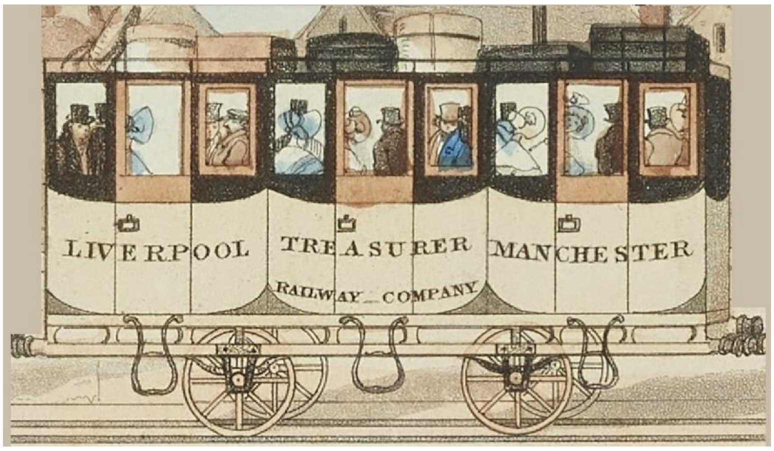
LONDON AND BIRMINGHAM RAILWAY.
RAILWAY CARRIAGES.

THE BOARDS of DIRECTORS of the LONDON and BIRMINGHAM and GREAT WESTERN RAILWAY COMPANIES hereby jointly offer the following PREMIUMS for MODELS or DRAWINGS of RAILWAY CARRIAGES of the first class, viz., 200*l* for the most approved plan, and 100*l* for the next. The models or drawings must be deposited at the office of the London and Birmingham Company, 83, Cornhill, London, on or before the 1st day of January next. The description of carriage known as the first class may be ascertained by application at the offices of the London and Birmingham Company in London, Birmingham, and Liverpool. The models or drawings for which the premiums are awarded, will be retained; the others will be returned on application.

By order,
RICHARD CREED,
C. R. MOORSOM.
Secretaries of the Board of Directors of the London and Birmingham Railway Company.

Nov. 6, 1835.

Speculating on the carriage design of the Liverpool & Manchester Railway between 1834 and 1835

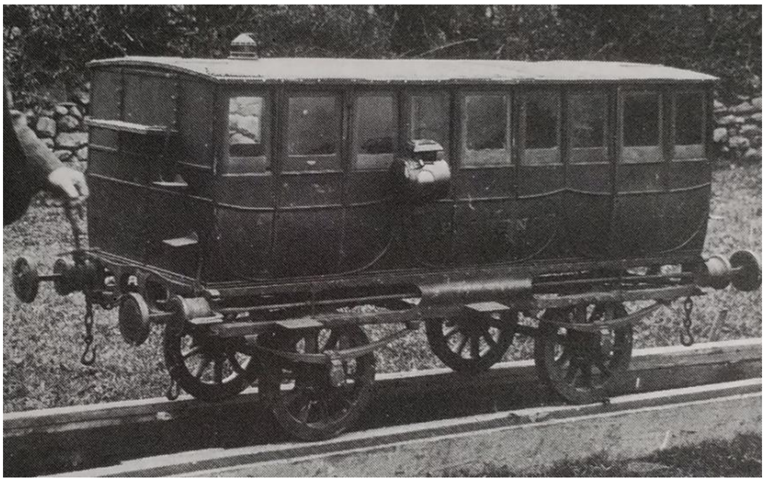


According to the depiction of the 'new' carriages in Ackermann's print Railway Conveyances from Liverpool to Manchester, 1834, First class carriages were:

1) Dumb buffered, but built on a larger frame possibly 14'-15'
2) Axle guards were still in the outside position
3) No coupling chains are visible
4) The carriages are sprung with leaf spring plates fitted to 'roller point' mounts
5) The carriages are still named in the old fashioned Stage coach manner
6) The steps are still in the old form of road carriage loops

Further observation of 1834 practice is limited due to the other elements of the image being informed by older images. In other words it appears that the entire illustration may have been constructed from older images with the exception of the four newer carriages and the mail. The story of the mail carriage will be covered in the section on Mail carriages.

Certain observations suggest that this design was out of date by sometime before October 1834. As the Dublin Mercantile Advertiser, and Weekly Price Current stated "The carriages of the first train had the buffers fitted with the spiral springs, the ingenious application of Mr. Bergin, one of the officers of the company – nothing could exceed the easy motion. The second train buffers were similar to those used on the Liverpool railway, fitted with elliptic springs [leaf]. The uneasy oscillatory motion of the carriages was most perceptible. Orders were issued by the directors that the engineers should not proceed beyond a certain velocity going and returning, lest their anxiety to show off should lead to any imprudent or unnecessary risk." Booth's patent, which has been misconstrued as included sprung buffers was actually only for the purpose of reducing this oscillation. Dated Jan 23 1836 the patent declares to be 'a new mode of connecting the carriages together. By which is effected an increased steadiness and smoothness of motions at high velocities, and which consists in an improved connecting apparatus [screw link coupling], by the action of which the buffers of the separate carriages of a train are held in contact with each other, so as to prevent that lateral, and serpentine motion which railway carriages moving at high velocities assume when they are attached together in the usual way by a simple draw chain.'



According to Geoffrey Hill this is [thought to be] the actual model, built between November 1835 and February 1836. Here photographed in 1896. Photograph is a detail from Hill's 'The Worsdells: A Quaker Engineering Dynasty' (1991) . [Copyright: TPC was absorbed by Ian Allan who informed me that the rights are now with Crecy Publishing who have not responded to my copyright requests]

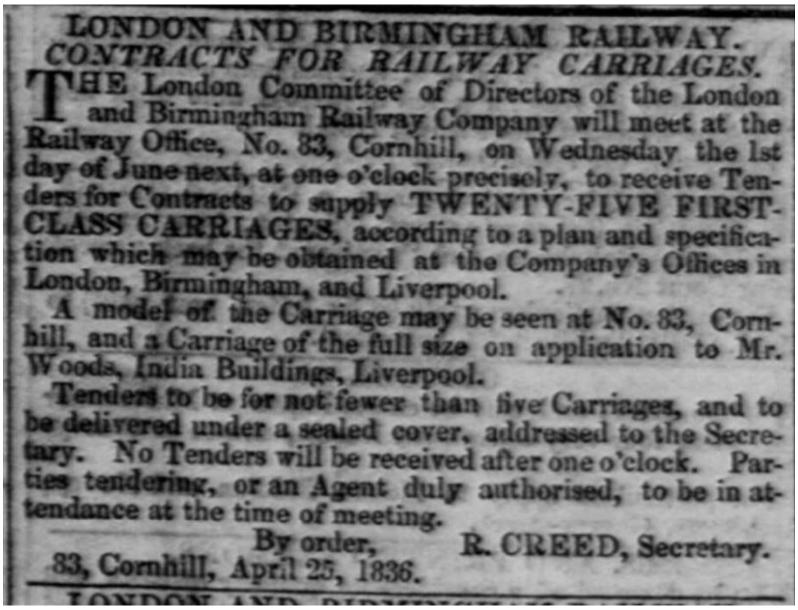
Acting on the premise that this is correct the following observations of are possible:

1) There are buffers with square push rods (and presumably central horizontal leaf springs)
2) Axleguards are mounted to the inside of the lower spar of the open frame
3) Coupling is via two 'carriage chains', there's no central coupling hook (on the model)
4) The leaf-springs and 'roller mounts' remain in the same position
5) The lettering 'experience' is visible on the centre door

6) The older carriage hoop steps are now replaced by square plates

The London & Birmingham specification drawing of 1836

Following the consultations Wright presented the Board with a final drawing which was approved and lithographed. Tenders were advertised for in April.



LONDON AND BIRMINGHAM RAILWAY.
CONTRACTS FOR RAILWAY CARRIAGES.

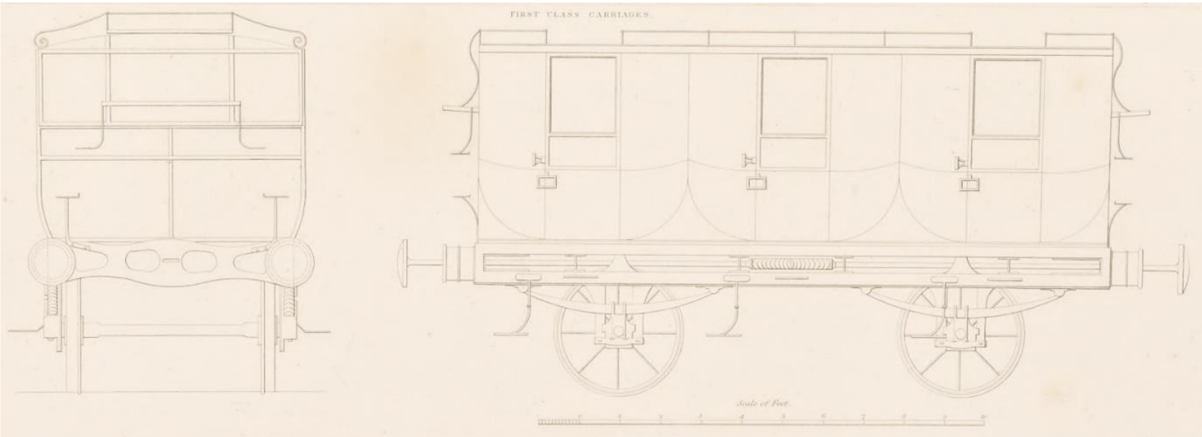
THE London Committee of Directors of the London and Birmingham Railway Company will meet at the Railway Office, No. 83, Cornhill, on Wednesday the 1st day of June next, at one o'clock precisely, to receive Tenders for Contracts to supply TWENTY-FIVE FIRST-CLASS CARRIAGES, according to a plan and specification which may be obtained at the Company's Offices in London, Birmingham, and Liverpool.

A model of the Carriage may be seen at No. 83, Cornhill, and a Carriage of the full size on application to Mr. Woods, India Buildings, Liverpool.

Tenders to be for not fewer than five Carriages, and to be delivered under a sealed cover, addressed to the Secretary. No Tenders will be received after one o'clock. Parties tendering, or an Agent duly authorised, to be in attendance at the time of meeting.

By order, R. CREED, Secretary.
83, Cornhill, April 25, 1836.

The process is an interesting one. Tenders were accepted without scrutiny and placed unopened, in the box. They were required to be ‘under a sealed cover’ I imagine so that no-one could peak and try to undercut a competitor. The box remained untouched until the meeting when it was opened and the tenders were discussed.

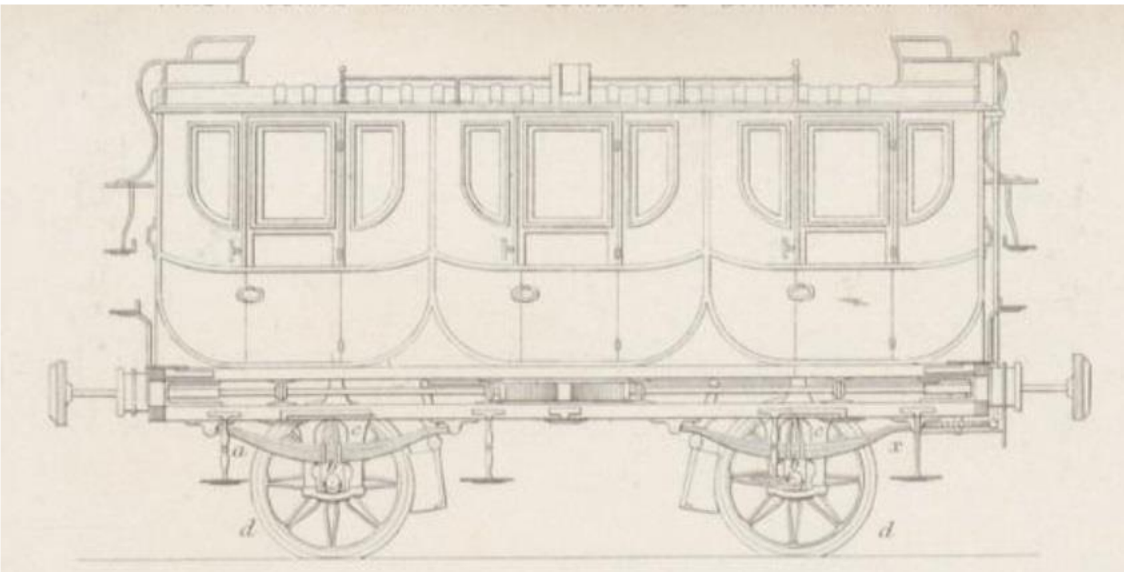


This is the version published Simms’ Public Works of Great Britain (1838) along with the written text. The actual specification drawing has some descriptive annotations. We are fortunate to have two versions of the specification one at the National Archives as well as this one in Simms. A few initial observations are, firstly, that the carriage is considerably simplified. Note there are no brakes or coupling devices of any kind, although six chains, two draw and four safety, are referred to in the list of ‘iron work’ in the specification. There is no visible profile to the roof, it was very low angled. No lighting, although the London & Birmingham, in consequence of night running and its tunnels would add roof lamps to each of the compartments. Note also there are no windows and the central buffer springs are exposed. Both companies would start by building such ‘blind’ carriages but in consequence of the GJR moving over to adding quarterlight windows, the London & Birmingham railway followed suite. The first carriage of both companies were blind but those that followed had quarterlights.

What we need to bear in mind is that this was an initial design brief. Wright was contracted to build to the specification but there are a number of missing elements that considerably alter the look of the design.

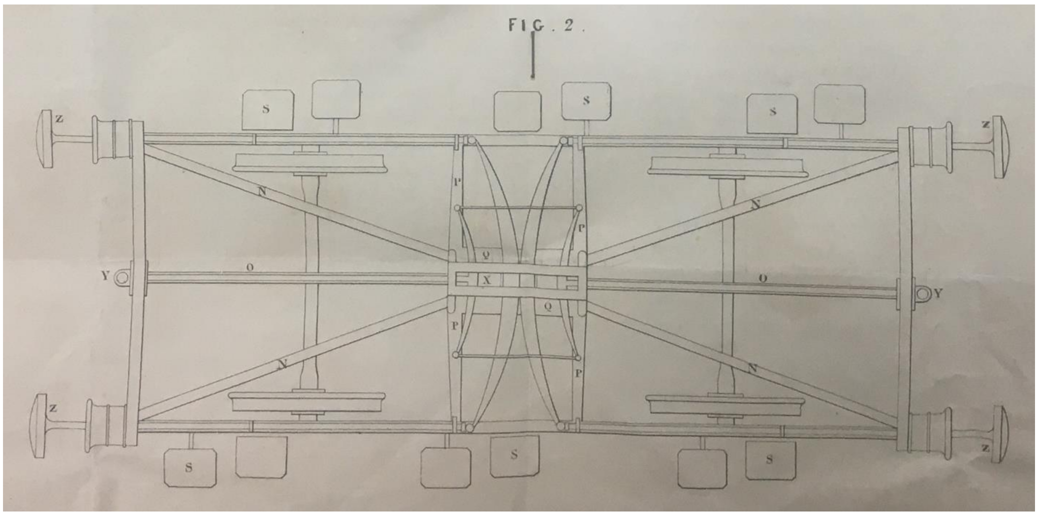
As a final note, the door rectangular handles and catches in the drawing match those of the GJR and Liverpool & Manchester carriages.

S.C. Brees, Railway Machinery (series 4)

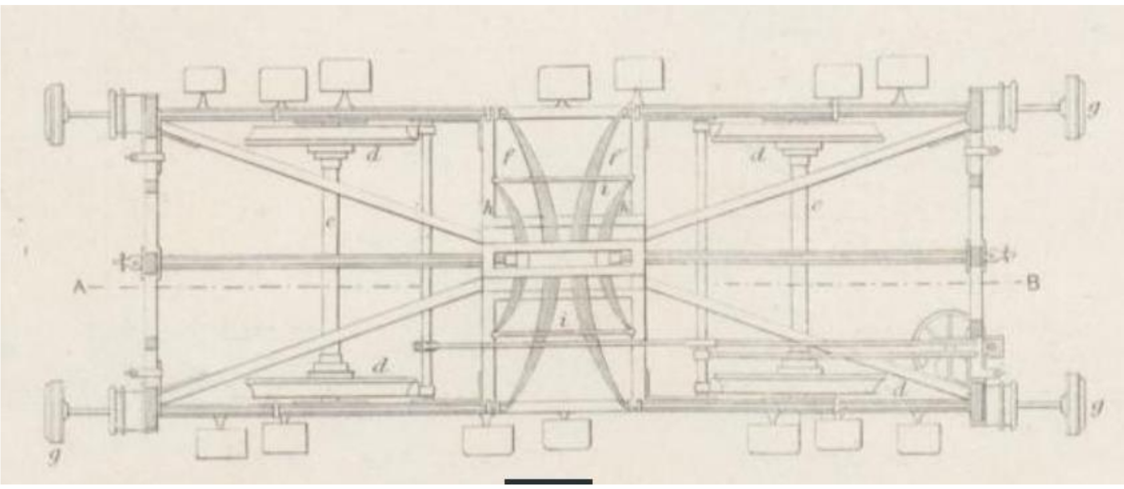


Wright made a number of changes to the specification, he wanted to make more but was restricted by the Directors. In any case the Directors required confirmation from Robert Stephenson.

Wright did get permission to round Worsdells' square 'buffer bar' (rod). He wanted to increase the central buffer springing from 15 to 19 plates and separate the leaves so that they didn't rub together in the centre but permission wasn't given. It is evident that this modification was carried out in later carriages.



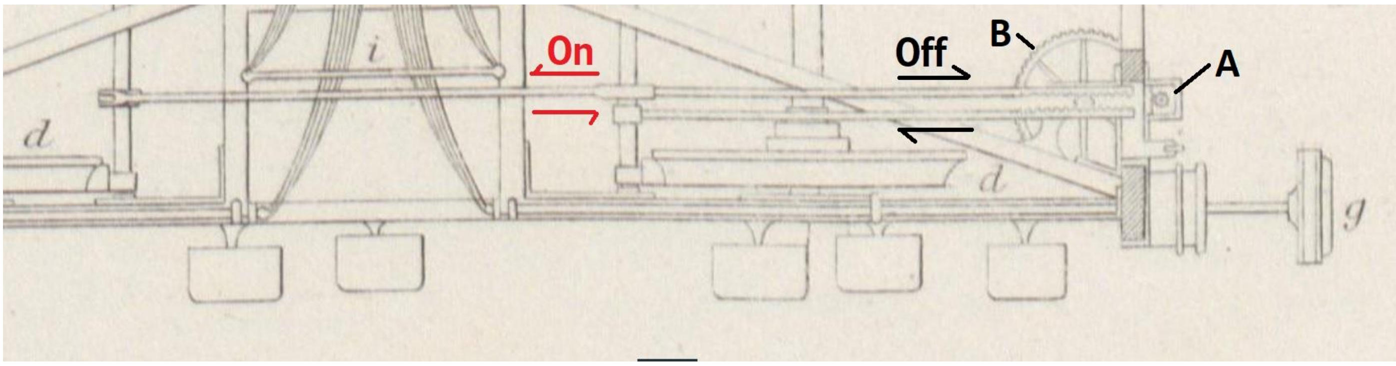
Note here the specification drawing shows the buffer springs rubbing together. Note again the absence of coupling or brake detail. Note also the addition of brackets for the safety chains.



Here in the later Brees plan the centre springs are separated, no longer rubbing together. Note also the addition of brakes acting on both wheels.

The First specification in the National Archives states that the “break [sic] acts on both sides of the two wheels on the same side of the carriage simultaneously.” This indicates that the brake only acts on one side, similar to the primitive brakes on road vehicles. There would be an issue created by this as it would put unequal strain on the axles. Later Charles Fox would include bracing to maintain parallel axles. Braking on one side wouldn’t help and might even cause the carriage to veer slightly.

The Liverpool & Manchester advised the London & Birmingham that they only required one in five carriages to have breaks but trains were getting longer and heavier, carriages were longer and heavier. At Euston, at this time, on the Camden bank, the carriage brakes were necessary to slow the train, without the benefit of the locomotive, as it descended the incline.

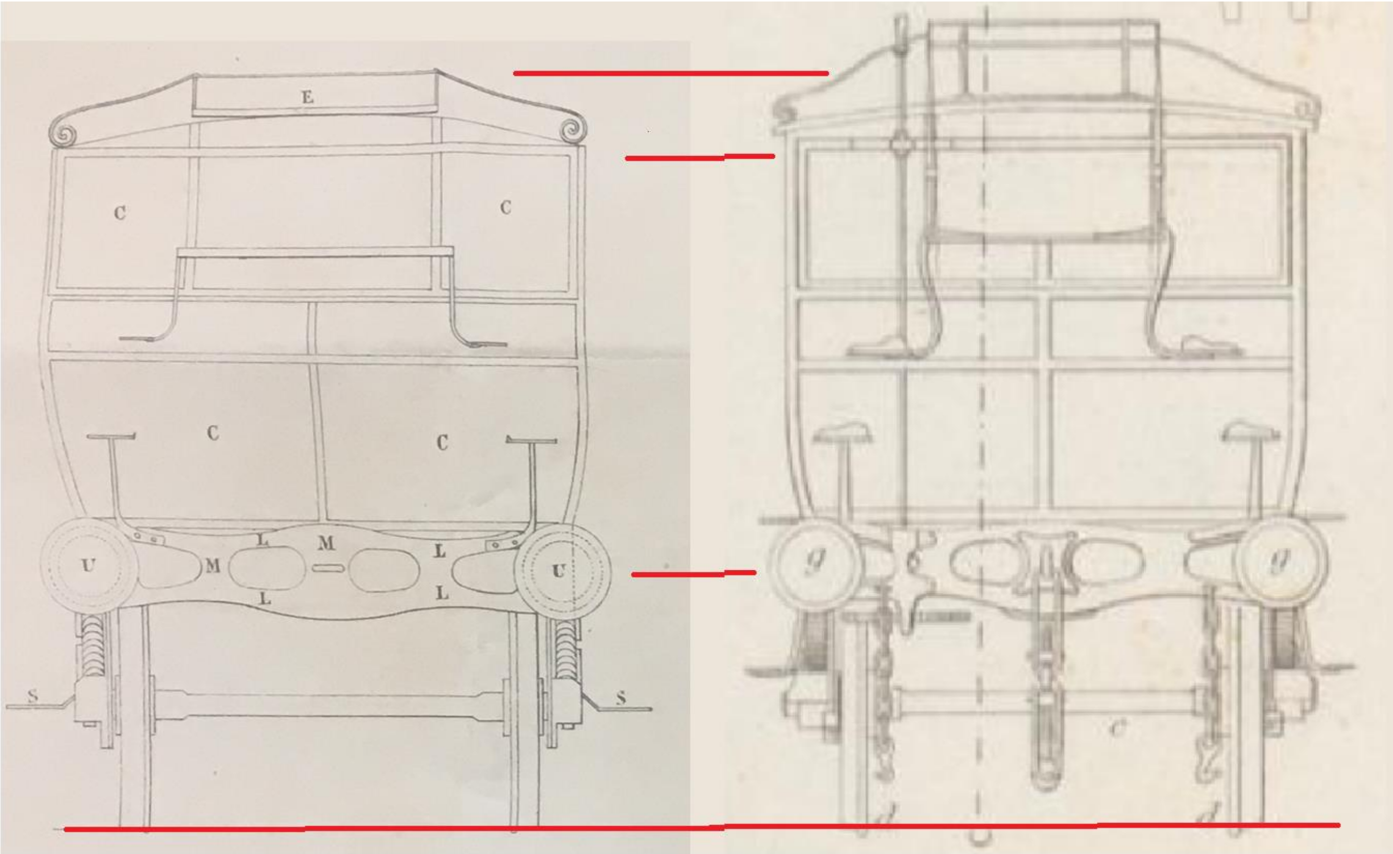


The brakes were activated by the guard sitting on the roof and rotating a handle attached to a vertical shaft that then rotates the horizontal cog creating forwards and backwards movement.

Other changes or developments

When the Grand Junction Railway opened in July 1837, and quite possibly due to overcrowding on the opening trains, the carriage springs were insufficiently strong to take the weight of the bodies and rough riding was recorded as the carriages banged on their axle boxes. What is clear in the Brees drawing is that the number of plates in the leaf springs has been increased or thickened. The suspension is still the early type, with the leaf springs being mounted through ‘roller boxes and rollers’.

The carriage steps are higher, perhaps a consideration to the London & Birmingham use of platforms, all be they low, with the exception of Euston. The steps also stick out less far.



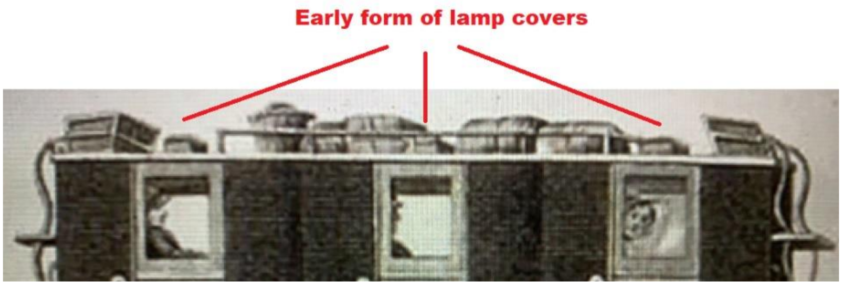
A comparison of the Specification drawing and Brees, end elevation, appears to indicate that the roof line, omitted in the specification is on the same curve, and the impression that the Brees version is taller is actually created by the guard seat having a higher back rail.

The specification doesn't have dimensions, referring only to the pattern coach at Liverpool & the model (Worsdells') at the company offices both based on the Liverpool & Manchester practice. This we can assume was also the GJR practice.

Despite the apparent differences between the specification and the Brees drawing I think there is sufficient evidence to confirm that the Brees drawing is an original London & Birmingham carriage as built.

Henry Booth's screw link couplings were fitted from the outset. This is visible in the Brees drawing. The company paying for the use of Booths' due to Booth's patent.[3]

Roof lamps were installed on all first class carriages, mails and some seconds.[4] It seems that the first lamps were those by the name of Miller & Co. A form of lamp cover can be seen on the illustration by Samuel Williams for Osbourne's Map and guide.



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[3] Minutes of the Carriage Sub Committee, 14th June 1837, Minute No.111 "That Mr Rathbone be requested to arrange with Mr Booth for the right of applying in all cases his patent Screw to the Company Carriages without limitation as to numbers in consideration of the payment of a sum to be mutually agreed upon."

[4] Minutes of the Sub Committee for Carriages [sic], 17th Oct 1837, Minute No. 129 "That Lamps be placed on the roof the centre [of each] compartment of the first Class Carriages"

In conclusion

Thomas Clarke Worsdell (II) returned from Germany towards the end of 1838 after which he became the carriage superintendent of the London & Birmingham (13th June 1839 to ~5th Nov 1840). Joseph Wright continued as the main carriage builder, although others companies still won contracts, until he was formally appointed following Worsdell's retirement. What I find particularly unusual, in the time that his status was only that of consultant carriage builder, he was still responsible for designing and producing the specifications and drawings of the carriages. These were then put out to tender and were shared with his competitors.