

## RICHARD BADNALL AND THE UNDULATING RAILWAY

**DOCUMENTS:** Technical correspondence and other papers concerning the “*Undulating Railway*” principle patented by Richard Badnall.

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**NRA REFERENCE:** H.M.C. 11608

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### INDEX TO THE BADNALL PAPERS IN THE SALFORD COLLECTION

Reference No.	Date	CONTENT
MS 1	1832	Papers relating to a patent Notes from J.L. Gardener to Robert Gill to the effect that Badnall had altered his affidavit.
MS 2	1832?	Richard Badnall the younger’s specification for “ <i>an Improvement in the construction of formation of the tram or rails or lines of rail or tram roads upon which locomotive engines shall or may work</i> ”
MS 3	1833-22	Letter from Robert Stephenson to Robert Gill, acknowledging receipt of Mr. Badnall’s work on railways and cancelling an appointment.
MS 4	1832 July 7	Form of oath signed by Badnall and witnessed by Brackenbury that his invention of “ <i>a certain improvement in the construction of formation of the tram or rails or lines of rail or tram roads upon which locomotive engines shall or may work</i> ” is his invention and entirely new. Also states intention to seek patents in Scotland and Ireland and
	1832 July 9	Letter from Thomas Gill of the Patent Office to J Brackenbury, solicitor of Manchester, re. The patents for Badnall’s improved trams or rails.

- MS 5            1832 July 7    Receipt from J L Gardener, Manchester for £60 from Mr. Gill (£40, for the experiments and £20 for Mr. Brackenbury to remit to the Patent Agent), both sums forming part of the £240 to be advanced on the joint account of Mr. Gill and Mr. Badnall for the purpose of effecting a certain improvement in railroads.  
and
- 1832 July 3/9 Letter from J L Gardener, Manchester to R Gill in Liverpool, on the advisability of taking out a Patent without delay.
- MS 6            1832 Sep 8    Draft for the specification of a “*certain improvement in The construction of formation of the tram or rails or lines of rail or tram roads upon which locomotive engines shall or may work*” for which invention a patent was granted to Richard Badnall the younger... by King William the Fourth, dated 8<sup>th</sup> September 1832.  
MS Notes: “*This draft was settled by Mr. Badnall but he afterwards enrolled a different specification*”.
- At end: “*The above is,. As well as Mr. Farey can recollect, the words of the specification he prepared for Mr. Badnall, and which was approved by him. The complete copy as finally settled for engrossing, was taken away by Mr. Fill. (Signed) John Farey*”.
- MS 7            1832 Sep 8    Richard Badnall’s invention.  
Patent for England, Wales, Berwick upon Tweed, the Colonies and plantations for Badnall’s “*improvement in the construction of formation of the tram or rails or lines of rail or tram road upon which locomotive engines shall or may work or be employed...*”  
Note on the back: “*by indenture dated the 19<sup>th</sup> day of September 1832 the equal undivided ninth part or share of the within letters patent was assigned unto the Revd. William Badnall of Wavertree near Liverpool*”.
- MS 8            1833 Jan 2    Letter from R Badnall to Robert Gill, referring to publication of Badnall’s book on the undulating railway; also the need for foreign patents for the invention.
- MS 9            1833 Jan 6    Copy of letter from Mr. Gardner, Manchester to Mr. Badnall in Douglas, suggesting the need for patents protecting the invention in Scotland, America and France as well as in England and the advisability of delaying Badnall’s projected lectures and publication of his book until these have been obtained.

- MS 10      1833 Jan 9      Letter from Richard Badnall, Douglas to KJ L Gardner, solicitor, Spring Gardens, Manchester: mentions meeting to be arranged with George Stephenson for attempting experiments and reports lack of progress on Scots and foreign patents.
- MS 11      1833 Jan 12      Copy of letter to George Stephenson from Robert Gill.
- MS 12      1833 Jan 12      As above.
- MS 13      1833 Jan 22      Mr. Roberts' test of patent.  
Sketch with note: "*The above was drawn and given to me by Mr. Roberts as a fair trial and test of any advantage that could be gained on the curves*" (signed) Robert Gill.
- MS 14      1833 Jan 30      Copy of letter from Robert Gill to George Stephenson, referring to visits by eminent Manchester men and to figures provided by Dr. Dalton supporting the advantages of the undulating railway.
- MS 15      1833 Feb 7      Letter from Mr. Laws to Robert Gill referring to examination of the patent by a barrister and its possible infringement by the London and Birmingham Railway.
- MS 16      1833 Feb 19  
Mar 16      Memo book with lists of visitors, including Robert Stephenson, with notes on experiments done in their presence.
- 1833 Mar 9      Letter from Robert Gill, Manchester to (?) George Stephenson.
- MS 17      1833 Feb 22      List of expenses incurred in the Patent now in progress for Mr. Badnall for his improvements in the construction and formation of trams or rail roads for Ireland... by Newton & Bevey, Patent Agents, Chancery Lane.
- MS 18      1833 Feb 27      Letter from John Cruso to Robert Gill referring to the section of the line of the High Peak Railroad,
- MS 19      1833 Mar 5      Receipt from W Newton (Office of Patents) to R Gill for 5 gns. for preparing and settling the specification of Mr. Badnall's railway patent...  
and  
1833 Feb 22      Letter from W Newton acknowledging receipt of £50 from R Gill for the Irish Patent, and promising to expedite its completion.

- MS 20            1833 Mar 12    Letter for R Badnall, Douglas to Robert Gill, Liverpool. Refers to the questions and answers replying to Stephenson's objections and asks Gill to make an appointment with Stephenson for him in Manchester for the 22<sup>nd</sup> or 23<sup>rd</sup> March.
- MS 21            1833 Mar 12    Questions supposed to be proposed to Mr. Badnall by Mr. Gill, founded on Mr. R Stephenson's objections. 9 questions and answers, arranged in volumes, with 3pp or remarks by Badnall at the end.
- MS 22            1833 Mar 14    Copy of letter from Robert Gill to ..Giles
- MS 23            do                Copy of letter from Robert Gill to Messrs Newton & Bevey, Patent Agents.
- MS 24            1833 Apr 2     Copy of a letter from R Badnall to the Editor of *The Mechanics Magazine* on the undulating railway. Refers to letter in *the M.M. from Junius Redivivus* (no. 505, 23 March 1833 pp419-22) and to remarks by the Editor, attacking the undulating railway. Reproduced in *M.M. no. 505*, April 13 1833, pp29-31.
- MS 25            1833 Apr 26    Letter from Richard Badnall, Farm Hill, nr. Douglas to Robert Gill, New Market Lane, Manchester: reiterates his faith in the invention and suggests that the best policy would be to arrange a trial themselves.
- MS 26            1833 May 7     Letter from Henry Booth of the Liverpool and Manchester Railway to Robert Gill, referring to consideration of the undulating branch line to the Whiston collieries by the Board and acknowledging the gift of a copy of R Badnall's book
- MS 27            1833 May 18    Letter from M Poole, Patent Office, to Robert Gill: re. Sealing of Badnall's Scottish Patent on the 11<sup>th</sup> March and an application for a Patent by a Mr. Jessop.
- MS 28            1833 May 24    Letter from Badnall to Gill, suggesting meeting with Robert Stephenson at Huyton Gate to survey the site of the proposed railway. Postscript: taking out a Patent for an improvement in locomotive engines, adding to the value of the undulating railway.
- MS 29            1833 May 27    Copy letter from R Badnall to the Directors of the Liverpool and Manchester Railway suggesting methods of construction of the intended branch railway from the Whiston Colliery to the main Liverpool-Manchester line.

- MS30            1833 May 27 & 28    Two letters from Badnall to Gill in Leamington, Warwickshire: reports on difficulties in acceptance of his plan by the Directors of the Liverpool & Manchester Railway
- MS 31            1833 June 27    Copy letter from Robert Gill to M Poole of the Patent Office
- MS 32            1833 July 18    Letter from Badnall to Gill: refers to correspondence in *Mechanics Magazine*. Urges necessity for a short stretch of railway (say Manchester to Stockport) to be under the control of Stephenson and himself in order to effect a trial. Refers to £5 spent on models in Liverpool. Mentions letter enclosed (not found) from R Stephenson opposing Badnall's invention.
- MS 33            1833 Oct 25    Letter from Badnall to Gill, Wood Norton, East Dereham, Norfolk: refers to the success of the experiments on the previous Sunday and asks for a loan of £100.
- MS 34            1833 Nov 19    Letter from Badnall to Gill in Manchester: refers to letter to Robert Stephenson and recommends immediate meeting with George and Robert Stephenson and preparation of a model by Robert.
- MS 35            1833 Nov 12    Copy letter from Gill to Robert Stephenson, junior.
- MS 36            1833 Dec 12    Letter from Badnall to Gill: refers to preparations for experiments and to a meeting with Stephenson brothers. Badnall can be contacted at Pendleton Colliery.
- MS 37            1834 Jan 22    Application to Old Quay Company, suggesting the construction of a railway from Manchester to Warrington.
- MS 38            1834 Feb 17    Copy letter from Gill to Robert Stephenson.
- MS 39            1834 May 12    Letter from Badnall to Gill, New Market Lane, Manchester: asks if R Stephenson's report has been received by Gill and hopes that Stephenson's views on the undulating railway will have changed.
- MS 40            Undated            Sectional drawings of a railway shed ?
- MS 41            1833 April 24    Letter from Robert Gill to Richard Badnall expressing concern on hearing that Badnall was considering selling his interest in the patents.

