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## **Department of Arts and Industries - Section of Technological Collections: Annual Report 1888 - 1889**

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Curator's Reports

Report on the Section of Transportation and 1889  
Engineering in the U.S. National Museum 1889  
By J. Elfreth Watkins, Curator.

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The routine work in the Section of Transportation and Engineering during the fiscal year 1888-1889, was interrupted by my absence from the Museum during almost the whole month of July, at the Ohio Valley Centennial Exhibition, at Cincinnati, where several series of models, photographs and drawings were placed upon exhibition, to illustrate the successive stages in the development of the art of transportation, from aboriginal times to the present era of the steamship and the locomotive.

It is believed that this was the first attempt in the history of expositions, to present an object lesson of the development, step by step, of our great systems of transportation.

While this first effort must be regarded as an experiment, it is gratifying to know that it met the approval of those interested in preserving the history of engineering science. This is particularly true of the objects in the fourth series alluded to below.



The exhibit was arranged in seven series#.

The first to show methods adopted by the aborigines and early settlers, and contained objects of special local interest to the residents of the Ohio Valley and of the old North West Territory.

The second contained only objects illustrating the development of (1) the American; and (2) the English locomotive. It is believed that this series contained a larger number of objects than had ever before been assembled to show the history of the locomotive.

In the third, illustrating the development of the American Passenger car, the objects were arranged according to dates, rather than as a series showing the progress of development. This arrangement was made necessary owing to the large number of experiments that were made before the present type

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#See- Contributions of the Department of Transportation and Engineering to the Ohio valley Centennial Exhibition 1888. (Proceedings U.S. National Museum, Vol. XI, Appendix). Smithsonian Institution. U.S. National Museum. No. 45.



of American car # came into general use.

In the fourth series were exhibited 45 models,\* illustrating the development of the American rail and track. In addition to these models several rail sections, that had been in service prior to 1835, were shown, attached by the original fastenings to the stone blocks which were used by early railway constructors..

In selecting objects for the fifth series, devoted to the development of the American steamboat and modern steamship, many illustrations of early attempts at invention, which may be regarded as chimerical, were omitted. This series was intended to show the beginnings of marine steam engineering, together with a very few types of modern steamships.

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# Many of the objects in this series were illustrated in "the Evolution of the Railway Passenger Car", by J. Elfreth Watkins - "Harper's Weekly", August 25, 1888

\* Illustrations of these models may be found in the "Development of the American Rail and Track", by J. Elfreth Watkins, read before the Annual Convention of the American Society of Civil Engineers, Seabright N.J., June 21, 1889.



The sixth series contains maps, showing the beginning and extension of the American railway system from 1830 to 1888; and in the seventh, palanquins, sledges, elephant howdahs etc., illustrating methods of transportation in foreign lands, were assembled.

The arrangement of objects in the alcove assigned to the Department of Transportation and Engineering, at Cincinnati, was completed about the last of July, when upon returning to Washington, my attention was directed to the rearrangement of the few objects which remained upon the floor of the Museum. Other duties engrossed my attention until late in November, when many of the objects in the exhibit alluded to above, were returned from Cincinnati, requiring a rearrangement of the exhibition series, which was completed early in March. Since that date the work of correspondence and taking care of the objects, which have been added to the collection has engrossed as much of my attention and time as could be spared from other duties in the Department of Property and Supplies, the present organization



of which, I trust, will permit me to devote more effort to the extension of the Section.



Among the important accessions received during the year, the following may be noted.

A handsome Japanese Kago, presented by TOKUGAWA IYENARI, 11th TAIKUN of Japan, to his daughter, upon her betrothal to Prince HOSOKAWA a DAIMIO of HIGO, 1835, obtained through Hieromich Shugio. This kago is made of wood, beautifully lacquered and elaborately embellished with crests of the TOKUGAWA and HOSOKAWA families. The interior is handsomely upholstered and decorated.

A model of a Japanese jinrikisha, (light covered vehicle with two wheels, drawn by a man or boy), together with the small painting, which accompanies it, gives an excellent idea of the manner in which this popular conveyance of Japan, which takes the place of the London cab, is used.



Among the objects especially prepared for the Cincinnati Exposition which have found a permanent place in the Collection, is a series illustrative of the history of transportation, before the advent of the locomotive, of which the following are worth of note:

Apache Squaw with carrying basket, (full-size figure), illustrating an aboriginal form of burthen bearing, since known as "toting", by the negroes of the Southern States.

Pack-mule (mounted specimen), illustrating means adopted by early settlers to transport freight across the Allegheny Mountains, the pack-saddle and manner of packing being in accordance with prevailing methods among the mountain "packers".

Ohio River Flat-boat (model). "The Mayflower of the Ohio",. It was upon a similar boat that the earliest settlers journeyed down the Ohio River and disembarked at Marietta.

Steamboat "Orleans", 1812 (model), the first steamboat on the Ohio River. This boat was built



under the direction of Robert Fulton and Nicholas Roosevelt.

Conestoga wagon, 1785-1830 (model). Wagons of this type were used in the transportation of emigrants and freight from the East, across the Alleghenies to the Ohio and Mississippi Valley.

Stage Coach (model). Type in use between Pittsburgh and Philadelphia, in 1825.

Canal Passenger Packet Boat, 1846 (model). Type used on the Pennsylvania Canal, Columbia to Hollidaysburgh, on the through line, Philadelphia to Pittsburgh. Through the courtesy of Mr. Wm. J. Latta General Agent and Mr. F. W. Webb, Foreman of the Pennsylvania Railroad Company, at Philadelphia, the last three models noted above, were constructed at the Philadelphia Shops, being a reproduction in miniature of the vehicle <sup>canal</sup> and packet boat exhibited by the Penna. R.R. Co., in the Trades' Parade at the Celebration of the Centennial Anniversary of the Adoption of the Constitution in Philadelphia, October 1887.



The series illustrating the history of the American locomotive has been very materially strengthened by the addition of several valuable models, among them being :

Trevithick's Locomotive, 1804, (model). This was the first steam locomotive to help man and was designed and constructed by Richard Trevithick. It ran for several months in 1804 between Pandyarren Works and the Glamorgan Canal, near Aberdare Junction, Wales, hauling cars laden with coal and pig-iron.

Jonh Steven's experimental locomotive, 1825 (model). The first locomotive built in America of which there is a reliable record. The original locomotive built by John Stevens had a multi-tubular boiler, and was experimented with on a circular track at Hoboken, N.J., during the years 1825, 1826, 1827 and 1828. This model was constructed in the National Museum Work Shops, from information furnished by MR. Francis B. Stevens, (a grandson of John Stevens) a distinguished mechanical engineer of Hoboken, N.J.,



who rode upon the locomotive when he was a boy and who was thoroughly familiar with its construction.\*

Locomotive "Best Friend", 1830 (model). The first locomotive constructed in America for actual service on a railroad. Built at West Point Foundry, New York, for the South Carolina Railroad. Made trial trip January 15, 1831. This model is constructed from the original drawings in possession of the American Society of Civil Engineers.

Locomotive "John Bull". Camden and Amboy Railroad. India ink drawing (on mat 30 by 40) from tracings of the original working drawings which accompanied the locomotive from Stephenson's Works, New Castle-on-Tyne, showing how the locomotive appeared when set up at Bordentown, N.J., August 1831. The tender, built at Bordentown shortly afterward, was improvised from a small 4-wheel construction car,

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\* The original multi-tubular locomotive boiler, constructed by John Stevens, 1825, for this experimental locomotive, was deposited in the U.S.N.M. by the authorities of the Stevens Institute, Hoboken, N.J., in the last fiscal year, and is referred to in my annual report for 1887 - 1888.



a whiskey hogshead being used for a water-tank.

The connecting-rods shown were never used,owing to sharp curves in the road.

Locomotive "Sandusky" (model). Driving wheels 4 feet 6 inches;cylinders,11 by 16 inches. The first locomotive in the state of Ohio,1837. This was the first locomotive built by Rogers & Co.( then Rogers,Ketchum & Grosvenor),at Paterson,N.J.

It was originally built for the New Jersey Railroad and Transportation Company,but,not being accepted by them,was purchased by J.H.James,of Urbana,Ohio,president of the Mad River and Lake Erie Railroad. It was shipped by canal October 14,1837, and when it arrived in Sandusky,November 17,1837, not a foot of railroad had been laid in the state. The gauge of the Sandusky's wheels,4 feet 10 inches, thus became the established gauge in the State of Ohio. This model was also constructed in the Museum Work Shops.



The handsome model of the Locomotive "Old Ironsides", built by Matthias Baldwin in 1832 and which Locomotive hauled the first passenger train in the State of Pennsylvania, which was constructed at considerable expense by the Baldwin Locomotive Works and presented by them to the Museum, is one of the most valuable accessions of the year.

This model, accurate in every detail, a faithful miniature of the early handiwork of the founder of the company, which has sent locomotives to every Quarter of the globe, will be a great aid to the future historian, who may <sup>wish to</sup> place upon record the facts connected with the beginnings of locomotive building in America.



Through the courtesy of the Steel Street Railway Company of Johnstown, Pennsylvania, who presented the Museum with 14 sections of street rails and 3 sets of joint fixtures, it has become the possessor of a nucleus of a collection, which it is to be hoped may soon be expanded until it shall illustrate the history of the street railway - preeminently an American invention in the beginning, and which has since been carried to every part of the globe. It is highly important that the history of a system, which has had so much to do with the growth of every American city should be preserved.

It is to be desired that other friends of the Museum will add to this nucleus by collecting early forms of street rails and track appliances.




Through the kindness of Mr.F.W.Webb,of the London and North-Western Railway,of England,whose numerous contributions have been acknowledged in previous reports,the section has been enriched by a series of graphic photographs of the exterior and interior views of the railway carriages occupied by the Queen of England and other members of the Royal Family,in their journeyings by rail,to different parts of the kingdom. The arrangement and decorations of these carriages,especially that reserved for H.R.H. the Prince of Wales,are in marked contrast to the palatial "Special." cars used by American railway officials and men of wealth.



Among the railroad relics received is the Bell of the old locomotive "Rahway", cast in 1838. This bell was one of the first alarm bells ever placed upon a locomotive; the bells which preceded it being generally used to communicate signals to the engineer by the conductor or brakeman. For this bell, as well as for a section of track, consisting of rails and wooden joint blocks, in use for many years on the New Jersey Railroad between Jersey City and New Brunswick, the Museum is indebted to Mr. James R. Smith, of Newark, N.J., one of the oldest supervisors on the Pennsylvania Railroad system.



Another valuable relic is a section of the first heavy iron rail rolled in America, a gift of the Baltimore and Ohio R.R. This rail is  shaped in section and was rolled for the B. and O. R.R. Co., in 1844, by the Mount Savage Rolling Mill in Allegheny County, Maryland. To commemorate this event the Franklin Institute of Philadelphia awarded a silver medal in October 1844 to the proprietors of the Mount Savage Rolling Mill. A duplicate of which has been promised by that Institute for the Collection.



A number of valuable drawings illustrating the development of marine steam engineering, have been added to that series, among them being :

Print of Jonathan Hull's steamboat, 1787, from draught published according to Act of Parliament, 1787. This is the first feasible proposition for navigating boats by steam on record.

Rumsey's steamboat, 1787. This is the boat in regard to the construction of which General Washington wrote to Rumsey after seeing his boat driven by the tide against the stream; and of which there is a piece of the original chain gearing in the Collection.

Steamboat constructed by John Fitch, 1787. This boat carried passengers, who paid fare, between Philadelphia and Burlington, on the Delaware River.

Engine and propeller wheels of steamboat constructed by John Stevens, with twin screws, in 1804; on mat 30 by 40 inches, made from the original engine in the Museum of the Stevens Institute, Hoboken, New Jersey.



The "Clermont". Fulton's first American steamboat. This steamboat made the first trip from New York to Albany in August, 1807, and remained in continuous service for several years.

Steamboat "Phoenix". The first steamboat to navigate the ocean and the first vessel built with wave lines. The engine and hull were constructed under the direction of John Stevens, at Hoboken, N.J. This vessel was launched about fifteen days after the "Clermont", and made the ocean trip from Sandy Hook to Cape May, on the way from New York to Philadelphia early in 1808.

Fulton's first Ferry System. Enlarged facsimile of original drawing made by Robert Fulton, 1812. This was the system in use at Fulton Ferry, New York City, for many years.

Steamship "Savannah": The first steamship to cross the Atlantic, 1819. This vessel sailed from Savannah May 22, 1819, under command of Capt. Moses Rogers, and arrived in Liverpool June 20, 1819.

The original log of this voyage in the hand-writing of Sailing-Master Steven Rogers is also preserved in the collection.



Among the relics relating to early steam-boats which have recently been obtained, may be noted:

Fac-simile of draught of letter from John Stevens, of Hoboken, N.J. to Robert Hare, Jr., of Philadelphia, written November 16, 1805, describing the steam-boat, with twin screws, which is illustrated in the drawing alluded to above.

Also an original copy of the Philadelphia "Federal Gazette and Daily Advertiser", published Monday, July 26, 1790. This paper contains an advertisement of the time-table of Fitch's steam-boat, showing the leaving and arriving time at Philadelphia, Bristol, Burlington, and Bordentown. Deposited by Richard G. Stevens.



During the year an entire rearrangement of the exhibition series was attempted, under the following temporary classification :

1. Objects and implements for burthen bearing by man and animals.
2. Objects and implements of human and animal traction, (street railway cars excepted.
3. Originals, models and drawings of stationary steam engines.
4. Originals, models and drawings of locomotives.
5. Models and drawings of passenger and freight cars.
6. Originals, models and drawings illustrating the development of the American rail and track, (steam railways and horse railways.)
7. Models, relics and drawings showing the beginnings of the steamboat and development of marine steam engineering.
8. Maps showing beginning and extension of the American railway systems.



9. Electrical machines, (telegraph and motors).

10. Air ships &c.



Owing to the nature of things, the study series is composed almost entirely of drawings and other graphic illustrations, in arranging which the same general classification has been temporarily adopted, as prevails in the exhibition series.



The following papers have been published during the year.

J. Elfreth Watkins.

Report upon the work in the Section of Transportation and Engineering in the U.S. National Museum, for the year 1888 - 1889. Published in the U.S. Museum Report for year Vol. p.  
Annual Report for the year.

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J. Elfreth Watkins.

Contributions of the Department of Transportation and Engineering to the Ohio Valley Centennial Exhibition. Proceedings U.S. National Museum. Vol. XI Appendix. No. 45.

A catalogue of objects exhibited by the Section at the Cincinnati Exposition.

J. Elfreth Watkins.

The Evolution of the Railway Passenger Car.  
Supplement to Harper's Weekly, Aug. 25, 1888.

Describing the construction of various types of passenger railway cars with 26 illustrations showing the successive steps, that have lead up to the most improved modern parlor and sleeping cars .



J. Elfreth Watkins.

"Origin of the English and American Railway Systems - Causes of their Differences".

Read before the Philosophical Society of Washington, February 1889. Describing the conditions of trade, manufacture and commerce which lead to the invention of the stationary engine, the railway and finally to the steam locomotive.

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J. Elfreth Watkins.

"Development of the American Rail and Track".

Read before the Annual Convention of the American Society of Civil Engineers, at Seabright, N.J. June 21, 1889. Describing the various types of wooden, cast iron and rolled iron rails together with a brief review of the history of the manufacture of iron and steel and the beginning and development of the American rail.

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I cannot close this report without calling attention to the necessity for additional space, in order to accommodate the normal growth of the Section.

From personal intercourse and correspondence with a number of prominent Engineers and Railway Constructors, I feel satisfied that the Collection could be rapidly increased, by the addition of valuable objects, if the space could be found to exhibit them. In no country in the world has there been such a revolution, in the methods of constructing bridges as in America, yet we are compelled to refuse to exhibit models of the early structures, now rapidly going out of use, owing to the crowded condition of the exhibition series. And the same statement holds good in regard to historic locomotives, cars and other bulky objects; it being possible to devote only 600 square feet, of floor space to the locomotive and railway car.



So much progress has been made in solving problems that have arisen in connection with electric propulsion, both on land and water, during the last few years, that it would seem proper to begin to collect objects illustrating the early history of the devices which have gradually been developed into the motors etc. now practically successful and in commercial use.

Such a collection, if properly made would also require considerable space for exhibition and must therefore be delayed for the present.



It is earnestly to be hoped that this condition of affairs, which is detrimental to the extension of this Section in common with others in the Museum, may not always exist.