GREY Charles McRae

(1877 - 1955)

New Jersey (USA)

Addendum

GREY Henry

(1849 - 1913) [1]

Charles McRae's father Henry GREY was a British engineer born on 1 January 1849 in London. He emigrated to the USA in 1870 and in 1876 he married Mary E. PERCIVAL in Pittsburgh. The latter was born in England in 1857 and had emigrated to the USA in the same year as Henry GREY (1870).

The couple had a son named Charles McRae GREY. He was born in 1877 in New Jersey.

According to the US Census of June and November 1880 the family lived in Saint Louis (Missouri). In June, Henry GREY's occupation was recorded as "rolling mill" and in November as "dealer Queensware". [2]

An obituary published in 1913 gives further details on his professional career: [3]

> *Henry Grey, well known as the inventor of the Grey mill for rolling structural shapes, died at his home in East Orange, N. J., May 4. He was born in London, England, on January 1, 1849. Coming to the United States in 1870 he found employment in the iron industry, and for a number of years was connected with steel companies in the capacity of superintendent and manager. He had a part in a structural steel mill enterprise at Duluth, and for a number of years was connected with the Cleveland Rolling Mill Company. He spent several years in the development of a new method of producing structural shapes and perfected a mill for rolling them. The first company to take up the process was the Differdingen Iron & Steel Works, Differdingen, Germany, a mill being built at this plant in 1902. Its construction is somewhat similar to that of a universal plate mill with separate sets of horizontal and vertical rolls. These sets of rolls form the web and flanges of the beam by combined rolling mill operations acting at right angles. The advantage of the Grey method is that the sections can be designed to give economical distribution of the metal, larger beams are rolled and the flanges are made much wider than is possible to produce in the usual beam mill. In 1907 the Bethlehem Steel Company installed a Grey mill at its Saucon plant at South Bethlehem, Pa., Henry Grey & Son being the engineers. The plant differed from that at Differdingen in that the latter finished beams from blooms in a single Grey mill, while at Bethlehem two mills were installed, one for roughing and the other for finishing.*
>
> *For the installation of the special plant at Differdingen Mr. Grey was awarded a gold medal in 1904 by the Société d'encouragement pour l'industrie nationale of France, an honour conferred on but few representatives of the United States. Mr. Grey retired from active business about three years ago.*

In November 1896 GREY joined the Ironton Structural Steel Company in Duluth (Minnesota) and in June 1897 GREY announced that he had invented a "*New form of structural steel*". [4]

> *One of the most notable accomplishments in the manufacture of structural steel within the past few years has been the production by the Ironton Structural Steel Company of Duluth, Minn., of girders of much smaller cross section than have ever before been made. This company worked four years under patents secured by James and Levi D. York endeavouring to accomplish this result, but from one cause and another it was not found practicable to successfully carry out the methods, and in November 1896, the writer, formerly general superintendent of the Cleveland Rolling Mill Company, assumed charge of the Duluth plant and developed a process which has demonstrated that it is practicable to produce girders of unusual dimensions and cross section, and to overcome the many difficulties which had heretofore been encountered.*

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[1] *FamilySearch database (9D4B-SPV)*
[2] *Wedgwood china porcelain (Wikipedia)*
[3] *The Iron Age, 8 May 1913, page 1147, also in Stahl und Eisen, 1913, Nr 22, page 908*
[4] *The Iron Age, 17 June 1897, page 14*

Henry GREY and Charles Albert PRINCE founded the company "American Universal Mill Cy" in New York to which GREY assigned most of his patents.

GREY did not find an investor in the USA willing to build an industrial plant based on his invention and in May/June 1898 he approached Paul WÜRTH (1863 - 1945) in Luxembourg. WÜRTH at the time was *administrateur délégué* of the "Deutsch-Luxemburgische Bergwerks- und Hütten Aktien-Gesellschaft", later "S.A. des Hauts Fourneaux de Differdange".

On 8 July 1898 WÜRTH signed a contract with GREY securing an option on acquiring the relevant patents and sent a delegation to the USA for evaluating GREY's rolling mill. [1]

The delegation, on behalf of the Differdange steelworks, bought the rights to GREY's patents in a number of European countries. GREY's inventions were immediately "reduced to practise" in Differdange.

Henry GREY and his son Charles McRae GREY accompanied the project from 1898 to 1902.

The process of acquiring the patent rights encountered many obstacles and the building of the rolling mill entailed high financial risks. The sequence of events are extensively described in two publications. [2] [3]

The Differdange venture, however, was a complete success.

It took up to 1907 before Bethlehem Steel built the first "GREY rolling mill" in the USA, equivalent to that built in Differdange.

US Steel made an attempt to build its own alternative rolling mill but ended up in a patent infringement suit with Bethlehem Steel in the US courts.

Henry GREY died in 1913 in New York at the age of 64.

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[1] *It is interesting to note that in June 1898 Grey held only one granted patent right in Europe, namely DE93321, granted on 16 August 1897; he had obtained, however, the corresponding US and Canadian patents.It is also of interest to note that Grey filed his first patent application in Germany in November 1896, just before joining the Ironton Structural Steel Company in Duluth.*

[2] *Biographie nationale du pays de Luxembourg : Fascicule 15 (1967), page 347*

[3] *Jhemp Biver, L'Usine de Differdange, Korspronk 11/1988 (with transcriptions of the correspondence with Henry Grey)*

Patents (listing) [4]

Henry GREY

	Patent number	Application date	Title
1	DE93321	20/11/1896	Walzwerk zur Herstellung von profilirtem Walzgut
	DE102031	24/09/1897	Doppelwalzwerk zur Herstellung von profilirtem Walzgut verschiedener Flantschenbreite
	DE107124	24/09/1897	Verfahren und Vorrichtung zum Walzen von Profileisen mit Steg und Flantsch
	US632181	22/07/1897	Apparatus for rolling beams, girders, etc.
	US635381	29/11/1897	Rolling mill
2	US635382	14/01/1899	Rolling mill
	CA62923	25/08/1898	Apparatus for rolling metallic articles
	CA67469	17/07/1899	Rolling mill
	CA69621	12/12/1899	Rolling mill
	LU3273	01/08/1898	Perfectionnements aux laminoirs pour poutres, colonnes, longerons métalliques, etc.
	LU3274	01/08/1898	Perfectionnements aux laminoirs pour poutres, colonnes, longerons métalliques, etc.
3	LU4501	09/08/1901	Perfectionnements aux laminoirs pour poutres, colonnes, longerons métalliques, etc.
	LU4502	09/08/1901	Perfectionnements aux laminoirs pour poutres, colonnes, longerons métalliques, etc.
	LU4503	09/08/1901	Laminoir pour la fabrication de pièces profilées
	LU4504	09/08/1901	Laminoir pour la fabrication de fers profilés
	LU4505	09/08/1901	Laminoir pour la fabrication de fers profilés
4	US758529	29/09/1902	Manufacture of flanged metal bars or beams and structural work
	CA91483	05/01/1903	Manufacture of flanged metal bars or beams and structural work
	DE162714	07/02/1902	Verfahren zum Walzen von Profileisen mit Steg und Flansch gemäß Patent 107124
	US943633	28/11/1902	Rolling mill
	LU4841	08/07/1902	Procédé et laminoir pour le laminage de fer profilé avec tige, et collet
5	US993242	11/09/1903	Solid-rolled cross-sectionally-H-shaped metal bar or structural section
	CA92004	02/02/1903	Mills for rolling metallic beams
	US1013649	14/09/1903	Solid rolled metal I-beam of nine inches and under twelve inches in height
	US1013650	14/09/1903	Solid rolled metal eight inch I-beam
	US1013651	16/09/1903	Solid rolled metal I-beam of sixteen inches and under twenty-five inches in height
	US1013652	16/09/1903	Solid rolled metal I-beam of twelve inches and under sixteen inches in height
6	US1034361	23/03/1904	Rolling flanged metal beams or bars
	US16097E	23/03/1904	Rolling flanged metal beams or bars

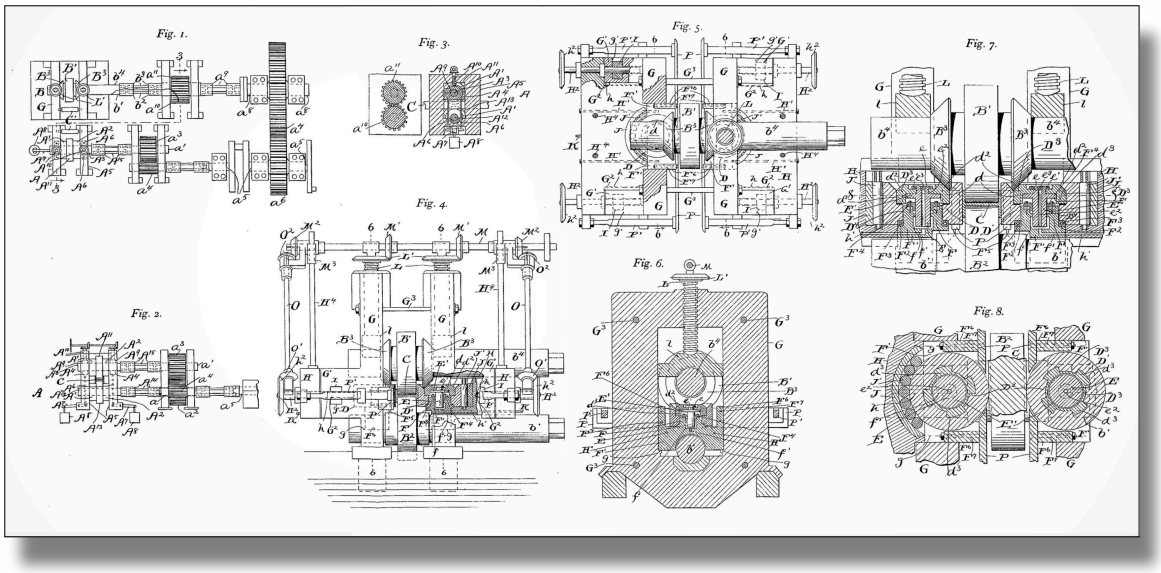
[4] *The list is not a complete list of Henry Grey's patents since a number of patents were filed in the name of "American Universal Mill Co" without designating an inventor. (see Listing below)*

Patents (details)

1 - Walzwerk zur Herstellung von profilirtem Walzgut

DE patent	93321
Application date	20 November 1896

Vorliegende Erfindung bezieht sich auf ein Walzwerk zur Herstellung profilirter Walzstäbe, bei welchem zwei liegende Walzen die Innenseiten und ein Paar stehende, seitlich zu den erstgenannten angeordnete Walzen die Aussenseiten des Walzstabes bearbeiten. Die Erfindung erstreckt sich auf die zum gemeinsamen Antrieb dieser Walzen angewendeten Mittel und auf die Anordnung der Walzen selbst in Verbindung mit einem weiteren Walzensystem zum Auswalzen der Profilkanten, welches vor den erwähnten, liegenden Walzen derartig angeordnet ist, dass das Walzgut auf letztere Walzen übergeht, bevor es die davor liegenden Walzen verlässt.



Corresponding patents

DE (2), US(2)

American Universal Mill Co

American Universal Mill Co was a patent holding company probably owned by GREY father & son [5].

	Patent number	Application date	Title
1	AT3314	13/08/1898	Walzwerk zur Herstellung von profiliertem Walzgut
	AT3315	13/08/1898	Doppelwalzwerk zur Herstellung von profiliertem Waltzgut verschiedener Flanschbreite
	AT5683	13/08/1898	Führungsvorrichtung an Walzwerken zur Herstellung von profiliertem Walzgut
	DE115617	19/05/1899	Führungsvorrichtung an Walzwerken zur Herstellung van profilirtem Walzgut
	DE119216	11/04/1899	Walzwerk zur Herstellung von profilirten Walzgut
	LU3917	21/02/1900	Laminoir pour la fabrication de pièces laminées profilées.
	LU3918	21/02/1900	Laminoir pour la fabrication de fers profilés
2	AT13489	15/07/1902	Lagerung für die seitlichen Vertikalwalzen eines Walzwerkes für Profileisen mit Steg und Flansch
	FR324040	15/07/1902	Perfectionnements aux laminoirs
	ES30105	15/07/1902	Perfeccionamiento en los laminadores
	DE146710	16/07/1902	Führungsvorrichtung an Walzwerken zur Herstellung van profilirtem Walzgut
	ES30181	29/07/1902	Un procedimiento para laminar hierros perfilados con alma y alas
	LU4849	15/07/1902	Coussinet pour les cylindres latéraux combinés avec les cylindres horizontaux pour le laminage du fer profilé avec tige et collet
	LU4850	15/07/1902	Appareil conducteur pour laminoirs de fer profilé avec paires de cylindres postposées

[5] *"AMERICAN UNIVERSAL MILL CO.-Inc. in W. Va. owns the patent rights for a new and improved process of rolling steel blooms, granted to Henry Grey as patentee. The company is not a manufacturing concern, but simply owns the patent rights granted in the United States and in foreign countries. Some years ago it sold to a German company its European rights. The American rights have been disposed of to the Bethlehem Steel Co. on a royalty basis." (Moody's Manual of Railroads and Corporation Securities, 1910, page 2489)*

Trademarks

1 - LU trademark 1448

Registration date 27 October 1906

Deutsch-Luxemburgische Bergwerks- und Hütten Aktien-Gesellschaft in Bochum

Gewalzte Metallstäbe, Schienen, Träger und Walzeisen in beliebigen Profilen.

Renewals

30 August 1916	N° 3040 Deutsch-Luxemburgische Bergwerks- und Hütten Aktien-Gesellschaft in Bochum
28 August 1926	N° 5666 Hauts-Fourneaux & Aciéries de Differdange-St. Ingbert-Rumelange, s.a.
28 August 1936	N° 8021 Hauts-Fourneaux & Aciéries de Differdange-St. Ingbert-Rumelange, s.a.
11 October 1946	N° 9951 Hauts-Fourneaux & Aciéries de Differdange-St. Ingbert-Rumelange, s.a.