THE FOWLER BOXCAR

The Beginning of the Single Sheathed Boxcar Era

By Ray Breyer
Naperville RPM, October 2024

The “Fowler” boxcar we all know:

But do we REALLY know it?

What is a “Fowler” boxcar?
What isn’t a Fowler boxcar?
What’s a “Fowler Clone”?
Who was “Fowler”?

And why do Canadians insist on calling these things “Dominion cars”?

BOXCARS BEFORE THE FOWLERS

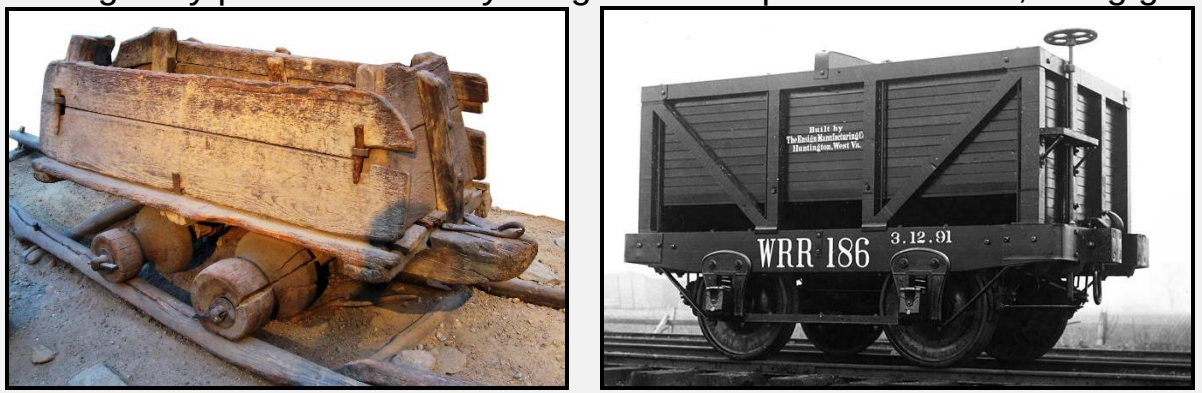
We all know about the three general types of boxcar construction: double sheathed, single sheathed, and all steel.

The ‘Rule of Thumb’ is that double sheathed cars came first, and then single sheathed, and finally all-steel.

This rule of thumb is wrong.

Or at least so general and non-specific to be useless.

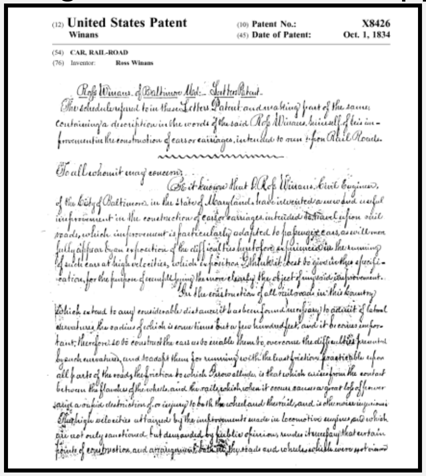
Animal and gravity powered rail-ways began in Europe in the 1500s, using gondolas.



1550 coal mine gondola from Transylvania versus 1891 mine car from ACF

In the USA, gravity railroads date from 1810, also using gondolas.
When steam railways began in the USA around 1830 they also used gondolas.
A very few “house cars” were built in the early 1830s. Basically “sheds on flat cars”, each car was unique.

In 1834, Ross Winans, chief mechanical officer of the B&O, patented the first two truck, four axle, independently articulated freight cars. An 1839 supplement drawing was added to the patent, showing a single sheathed boxcar.


(12) United States Patent
Winans

(10) Patent No.: X8426
(45) Date of Patent: Oct. 1, 1834

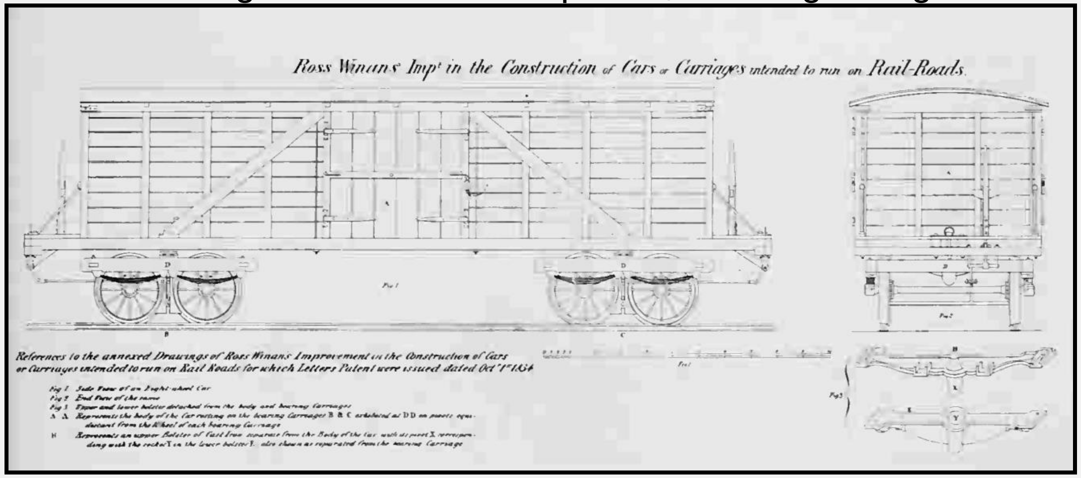
(54) CAR, RAIL-ROAD
(76) Inventor: Ross Winans

Ross Winans of Baltimore Md. — Letters Patent

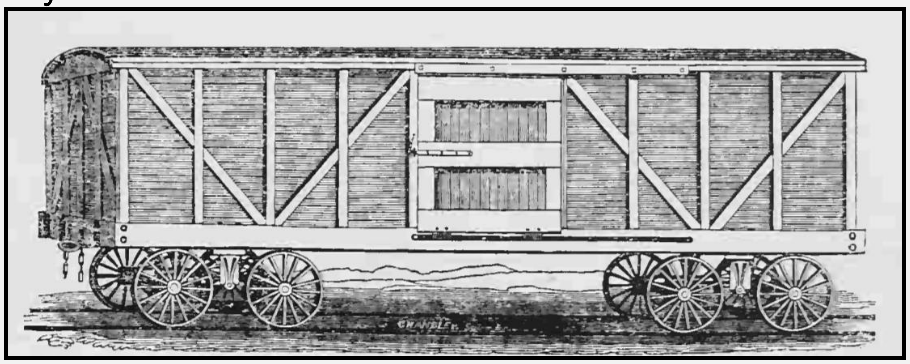
The schedule referred to in these Letters Patent and making part of the same, containing a description in the words of the said Ross Winans himself of his improvement in the construction of cars or carriages, intended to run upon Rail Roads.

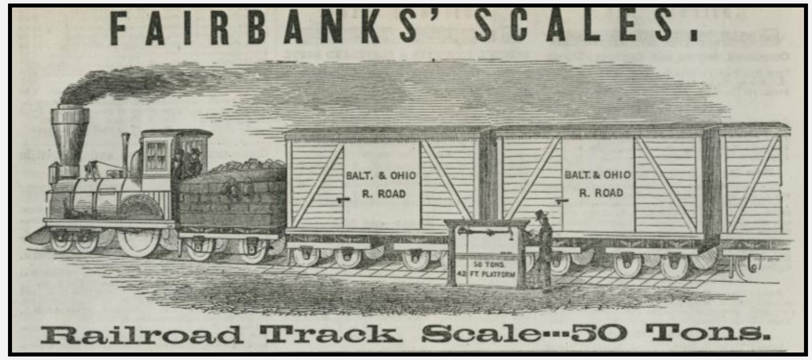
To all whom it may concern:

Be it known that I Ross Winans, Civil Engineer, of the City of Baltimore in the State of Maryland have invented a new and useful improvement in the construction of cars or carriages intended to travel upon rail roads, which improvement is particularly adapted to passenger cars, as will more [illegible]



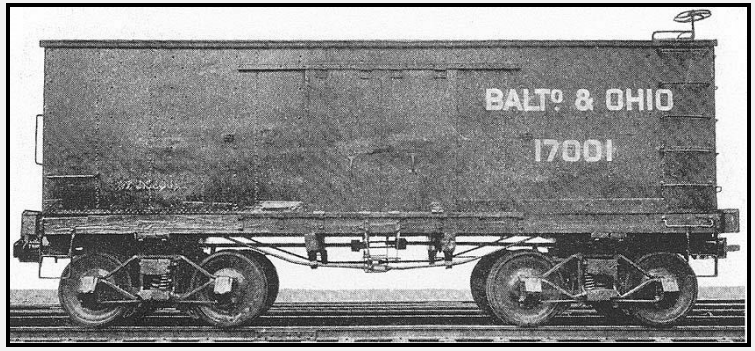
By the 1840s most woodcut illustrations of boxcars show them as B&O standard "outside braced" cars.

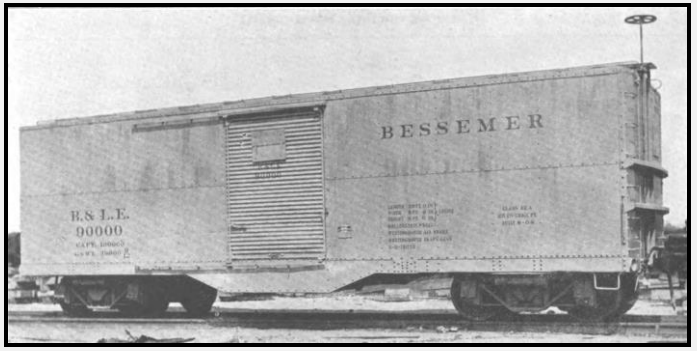




A few older Winans-inspired cars could be seen through the Civil War.

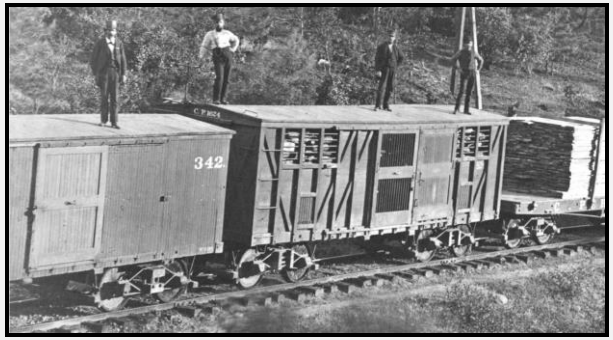
Some of the first true boxcars were single sheathed.





Some early boxcars were built from steel (or iron), although mostly in Europe.
The first know boxcar patent (US29510) is from July 1860, and was for an all-steel car.
The first production all-steel boxcars are from 1907, predating “modern” single sheathed boxcars.

By the 1880s almost nobody had single sheathed boxcars, with the largest fleet being a small and ageing group of Southern Pacific fruit cars (ex-Central Pacific).



CP/SP ca.1878

WVA&P ca.1885

D&IR ca.1895

By 1906 the only remaining single sheathed boxcars were a fleet of 1,500 all-wood cars owned by the Mather Car Co. These cars, while interesting enough, never influenced car design with any other railroad or leasing company.

In 1902 C.A. Seley took his composite steel and wood bodied gondola and hopper design, and applied the same construction technique to create a group of boxcars for the Norfolk & Western.

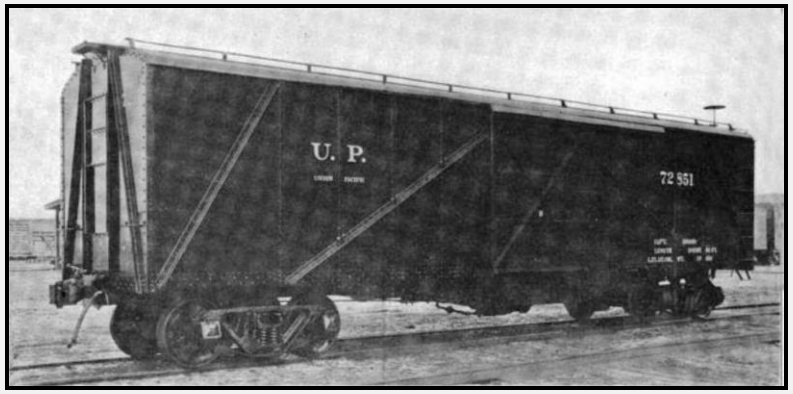
N&W 62057 was built by ACF's Huntington Shops in 1904

Seley's new car framing designs (which he never patented) slowly gained acceptance by the industry, especially with western railroads. All were double sheathed.

CRI&P 33900, ACF 1906

D&RG 63499, ACF 1909

The first “modern” single sheathed boxcars were three small groups of all-steel cars built for the UP by the McKeen Motor Car Co. The first two cars were similar but featured different side bracing. UP 72850 and 72851 were both built in mid-1906 at the UP’s Omaha NE car shops (which McKeen used as their assembly plant).



In 1910 UP 72851 was renumbered UP 100000, UP 72850 was renumbered UP 100001, and McKeen built another 24 as copies of 72850/100001, numbered 100002-100026. An unrepeated experiment, these 26 cars ran into the 1940s in revenue service, with a few surviving as MOW equipment into the 1960s.

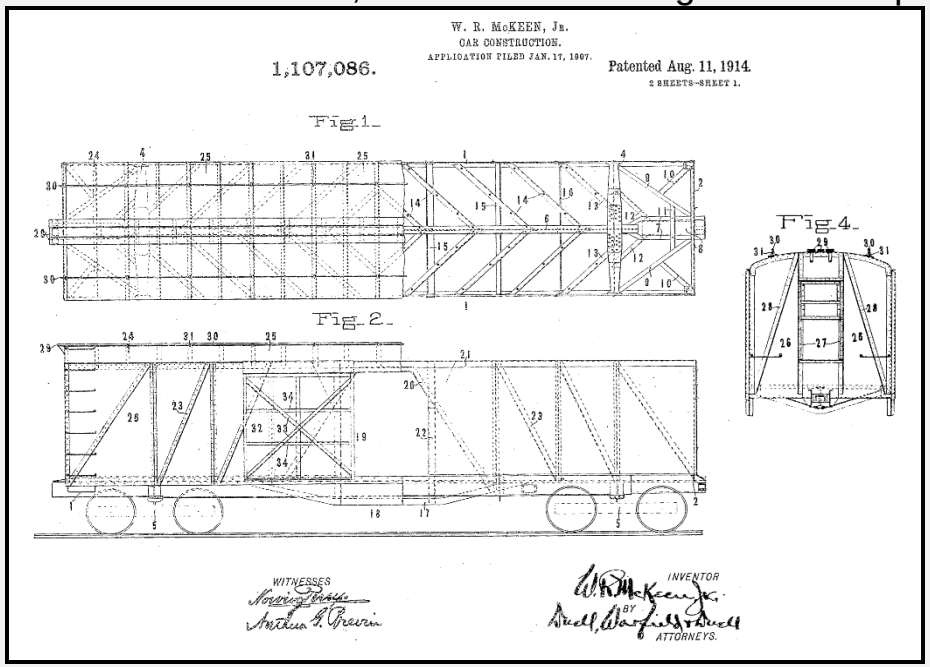
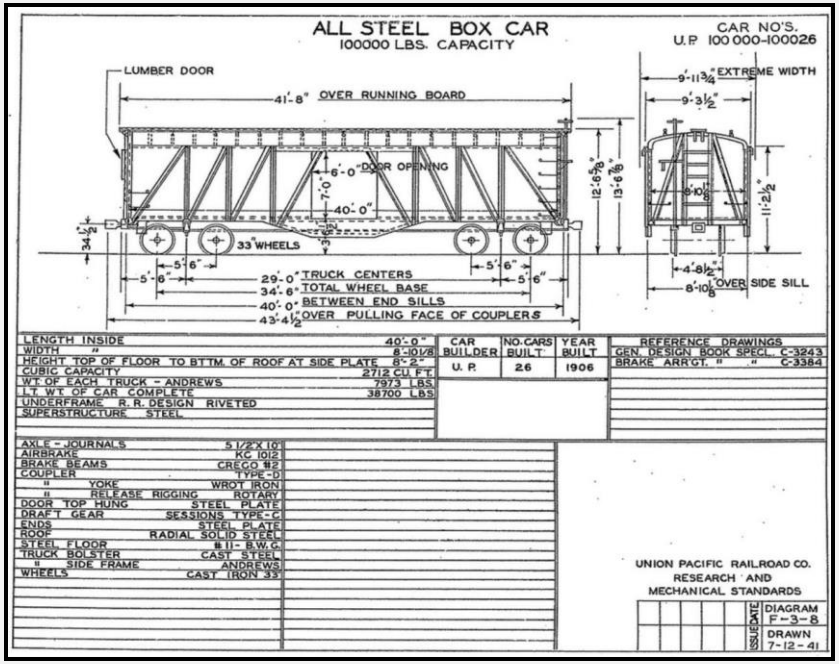

W. R. McKEEN, Jr.
CAR CONSTRUCTION.
APPLICATION FILED JAN. 17, 1907.
1,107,086. Patented Aug. 11, 1914.
2 SHEETS-SHEET 1.

Fig. 1.

Fig. 2.

Fig. 4.

WITNESSES
INVENTOR
BY
ATTORNEYS.

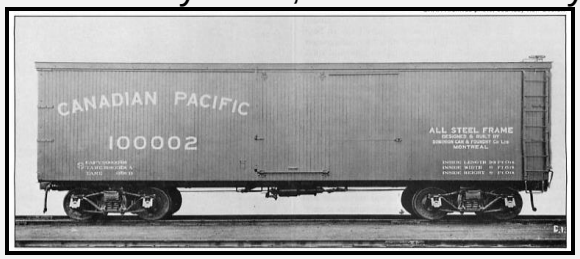


As with the Mather boxcars, these all-steel cars didn’t affect future boxcar designs.

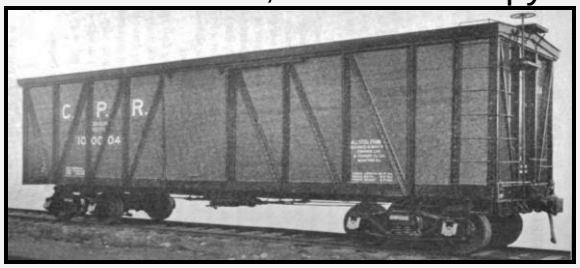
THE FIRST TRUE SINGLE SHEATHED BOXCARS

In 1908 the Canadian Pacific Railroad was looking for an affordable way to build a large number of grain-carrying cars to keep up with increased freight car demand due to westward expansion. The CP ordered a small group of prototype cars to test various modern construction concepts, with W.E. Fowler, the CP's Chief Mechanical Officer, overseeing the project.

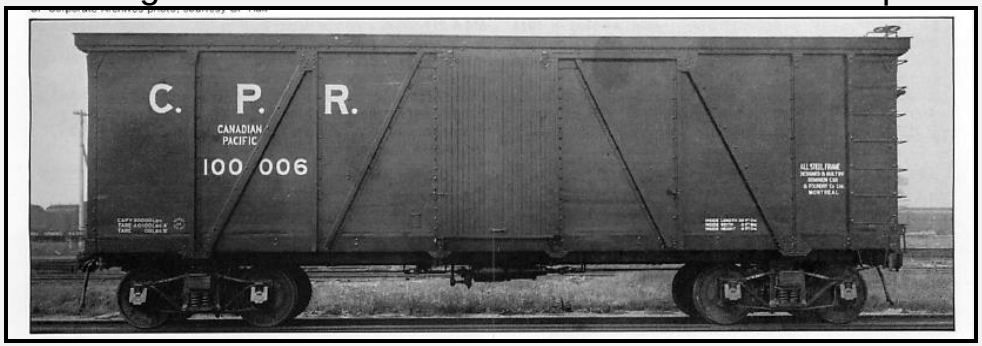
The first car built was CP 100002, built in Montreal by the Dominion Car & Foundry Co., with W.S. Atwood acting as project engineer. The car was built in July 1908, and was a Seley-type "inside steel frame" car.



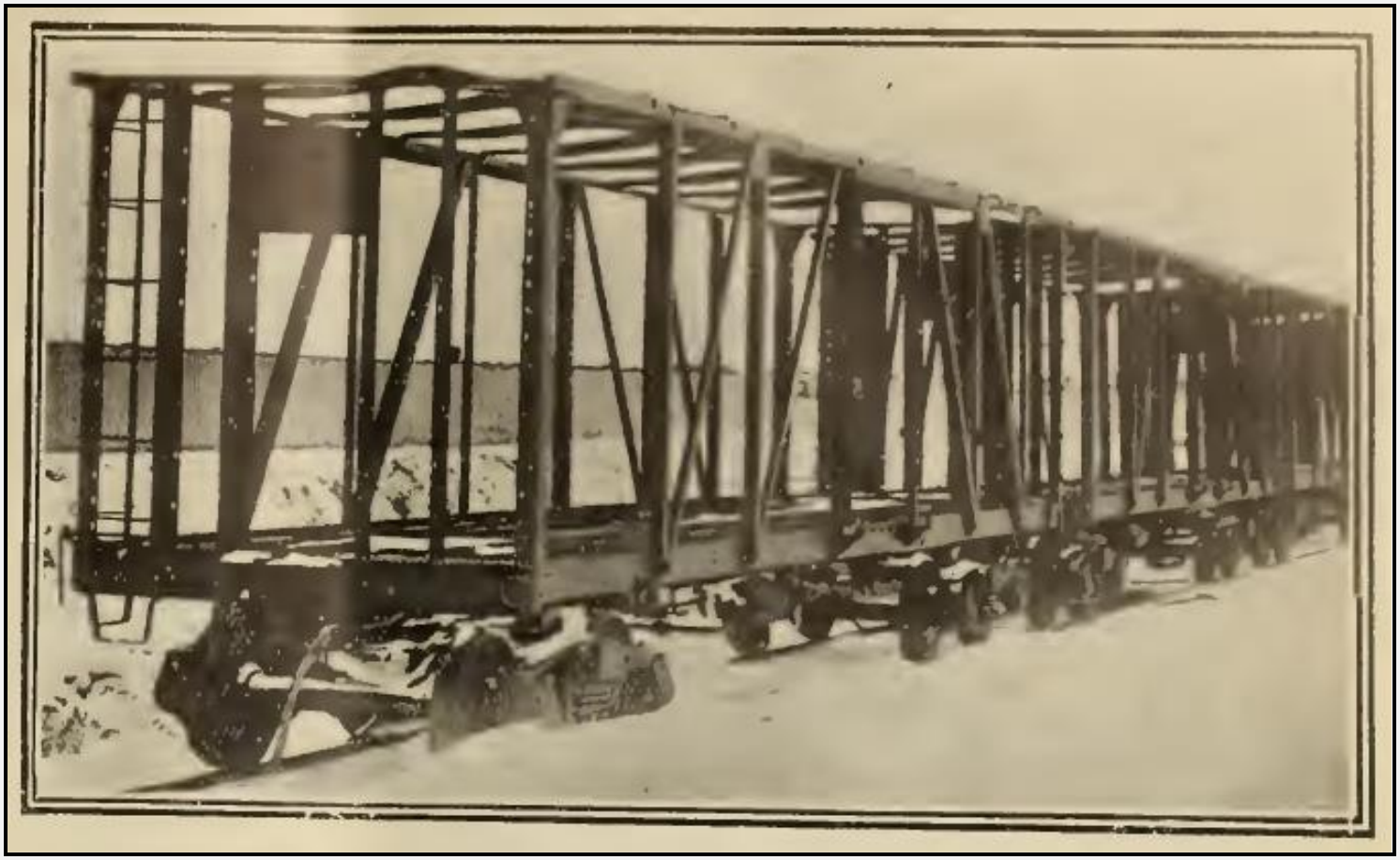
The second car, #100004, was built by DC&F in 8/1908, and was a copy of car 100002 without exterior sheathing.



The third car, CP 100006, was built by Dominion in October 1908, and was a "simplified" single sheathed design built based on what was learned from the previous two cars.



The time between designing, building, and evaluating the three cars was surprisingly short, with the Canadian Pacific placing an order for 500 copies of CP 100006 in December 1908. Dominion began delivering the partially built cars to the CP's Angus shops in the spring of 1909, and an order for 1,000 more cars was placed almost immediately. Orders for the new cars exceeded Dominion's capacity, so later in 1909 DC&F bought two other Canadian freight car firms and reorganized as the Canadian Car & Foundry Company.



Some of the first Dominion-built cars head from Dominion's plant to the CP's Angus Shops to be sheathed and painted. Photo from Railway and Marine World magazine, January 1910.

These Canadian Pacific boxcars began running in service in Canada and the United States in mid-1909, and the single sheathed boxcar era began.

WHO WAS FOWLER?

William E. Fowler, Sr. is a bit of a mystery man, and it's no wonder that nobody in the rail history or modeling community has written about him. No photos are known to exist, contemporary journals didn't write much about him, and he seems to appear and disappear from the freight car business relatively quickly.

I was able to build a biographic timeline of W.E. Fowler, based on what snippets of information are out there. Specifically, US and Canadian patents, mentions in the Master Car Builders' Association annual reports, assorted mentions in trade journals between 1882 and 1918, and a Supreme Court ruling.

Fowler was a typical 19th Century "Self-Made Man". Born in the UK (or possibly Scotland) in 1856, he immigrated to the United States in the late 1870s. Moving west, in 1880 he got a job with the Union Pacific as a car builder, and within three years was a car construction foreman. He was promoted to the UP's Master Car Builder in 1894, and at that time his career took off. Working for the Southern Pacific between 1900 and 1902, he was hired by the Canadian Pacific to be their Master Car Builder in May 1902. While working for the CP Fowler served two terms as an MCBA vice president, and was elected president of the MCBA for the 1906-1907 term.

As one of the few master car builders working for a large Class One railroad, Fowler knew most people in the industry, including C.A. Seley and W.R. McKeen, two pioneers in modern freight car construction. Both men influenced Fowler's car designs in some capacity.

As the Chief Master Mechanic for the Canadian Pacific, he oversaw the construction of the three prototype steel-framed boxcars, as well as the initial 1,500 production cars. Fowler left the CP abruptly in 1909 citing "health reasons", moved to the United States, and began marketing what was called "his" boxcar design.

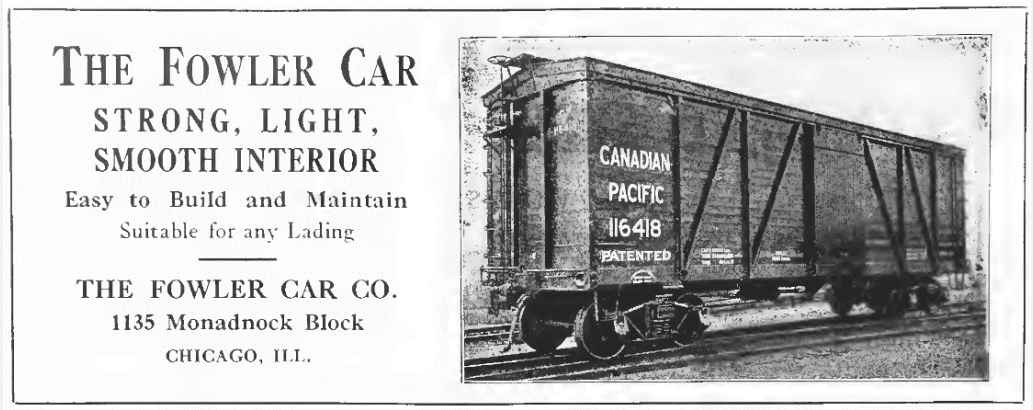
Fowler formed "The Fowler Car Company" in 1910, headquartered in Chicago. There's no record that Fowler ever lived in Chicago, however. His son, W.E. Fowler, Jr. worked as a mechanical engineer for Simplex, designing car brake equipment. Junior lived in Hammond IN, and may have even worked for his father, overseeing the Chicago office.

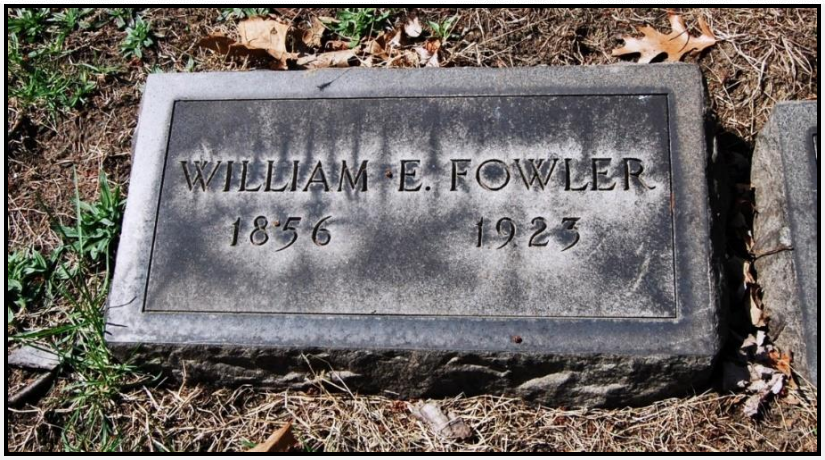
In his lifetime, Fowler was granted at least 14 Canadian and 28 American patents, almost all for single sheathed boxcars.

A BIOGRAPHIC SKETCH OF WILLIAM E. FOWLER, SR.

- 4/27/1856 - born in Weymouth England (or possibly in Scotland and moved to the UK as an infant).
- Circa 1875-1878 - Immigrated to USA.
- 1879 - Married Margaret McLeod (had five daughters & 2 sons).
- 3/1880-9/1882 - Car builder for the StLIM&S. Lived in Bearing Cross, AR.
- 10/1882-11/1883 - Car builder for the UP. Lived in Denver, CO.
- 11/1883-12/1889 - Car Foreman, UP (Denver).
- 1890-1891 – General Car Foreman, DT&FtW (Denver).
- 1891-1893 - Car Foreman, UP (Denver).
- 5/30/1893 - First US patent issued (US498234), for an all-wood, drop-end coal gondola.
- 1894-1900 - Master Car Builder, UP (Denver).
- 1896-1900 - Master Car Builder, UPD&G and DL&G (Denver).
- 1896 - Fowler joins the Master Car Builder's Association.
- 1900-4/1902 - General Car Inspector & Master Car Repairer, SP. Moved to Sacramento CA.
- 5/1902-6/30/1909 - Master Car Builder, Canadian Pacific. Moved to Montreal QC.
- 1904-1906 – Elected Vice President of the MCBA.
- 1906-1907 – Elected President of the MCBA. Pays $204 into dues fund (typical dues were $10).
- 1906-1907 – Elected President of the Canadian Railway Club.
- 7/2/1908 - Submits US patent request for a single sheathed boxcar. US962425 is granted on 6/28/1910 and reissued on 5/13/1913.
- 8/25/1909 - Granted Canadian patent CA122944, which is the same as the above US patent.
- 9/1909 - Quits the CP due to "health reasons". Moves to California.
- 1909 - Quits the MCBA
- 1910 – Incorporates "The Fowler Car Company" in Chicago.
- 1911 – Moves his family from Montreal to Los Angeles.
- 9/16/1912 - First mention of The Fowler Car Co., in patent US1062701. The company also begins advertising.
- 3/11/1913 - Six more Canadian patents issued for various design features of single sheathed boxcars.
- 7/1/1913 - Same patents issued in the United States.
- 4/21/1914 - Four US and one Canadian patents issued, again for single sheathed boxcars. Patents refer to "single sheathed cars of the Fowler type".

- 5/28/1914 - US Patent submitted for an all-steel boxcar (US1151351). Plans for the car look identical to CC&F 201 / CP 24000 built in June 1914.
- 7/20/1915 - Patent submitted for boxcar floors. Patent rejected. Fowler sues US Patent Office.
- 1916 - Fowler's home address stated as 53 West Jackson Boulevard, Chicago IL. That's the Monadnock Building, the world's largest office building when built in 1893.
- 4/17/1917 - Ewing vs. Fowler Car Co., US Supreme Court ruling #721. Protecting 1915 patent of boxcar floors. Fowler loses. Patent and SCOTUS documents state that he lives in Chicago; RyME Magazine articles say that he actually lives in Los Angeles.
- 6/4/1918 - Last patent issued to Fowler (US1268340) for house car running board supports.
- 1919 – The Fowler Car Co. closes.
- 1920-1922 – Hired as chief engineer & General Superintendent for the Montour RR. Lived in Coraopolis PA.
- Died 1/3/1923, buried in Wilkinsburg PA.





FOWLER'S SINGLE SHEATHED BOXCAR

Time to stir up the Canadians…

W.E. Fowler is the father of the "modern" single sheathed boxcar, and the "Canadian" short, single sheathed boxcar was designed by Fowler, not DC&F.

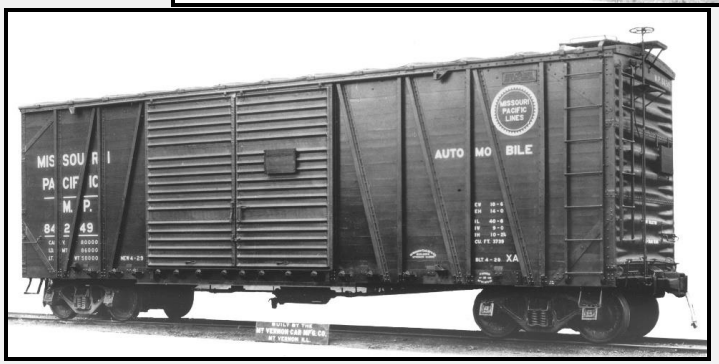
1) Fowler was a Master Car Builder for various large railroads between 1894 and 1909.
2) Fowler becomes Master Car Builder of the Canadian Pacific in May 1902.
3) Fowler becomes president of the MCBA and Canadian Railway Club in 1906.
4) Many things happen quickly between 1908 and 1910:
    a. Early 1908 - The Canadian Pacific decides to build a series of prototype boxcars.
    b. 7/2/1908 - Fowler submits a patent for a single sheathed boxcar. Granted as US962425 on 6/28/1910.
    c. 7/1908 - CP 100002 is built by Dominion Car & Foundry Co.
    d. 8/1908 - CP 100004 is built, also by DC&F. First "modern" single sheathed boxcar.
    e. 10/1908 - CP 100006 is built by DC&F.
    f. Spring 1909 – CP orders 1,000 single sheathed boxcars based on CP 100006.
    g. 9/1909 – Fowler quits the CP, moves to California.
    h. Late 1909 – DC&F buys several smaller car builders and forms the Canadian Car & Foundry Co.
    i. Spring 1910 – Fowler incorporates "The Fowler Car Company."
    j. Spring 1910 – CP orders another 3,000 cars based on CP 100006.
    k. 1912 – The Fowler Car Co. begins advertising, using images of CP cars.

5) In 1907 the only single sheathed boxcars in service were all-wood Mather cars and all-steel McKeen cars.
6) Before 1908 there are no patents for metal framed, inside wood sheathed boxcars.
7) Before 1908 there were no metal framed, inside wood sheathed boxcars running for any railroad.
8) In 1908 W.E. Fowler submitted a patent for metal framed, inside wood sheathed boxcars, and AFTERWARDS Canadian Pacific and the Dominion Car & Foundry built car #100002, 100004, and 100006.

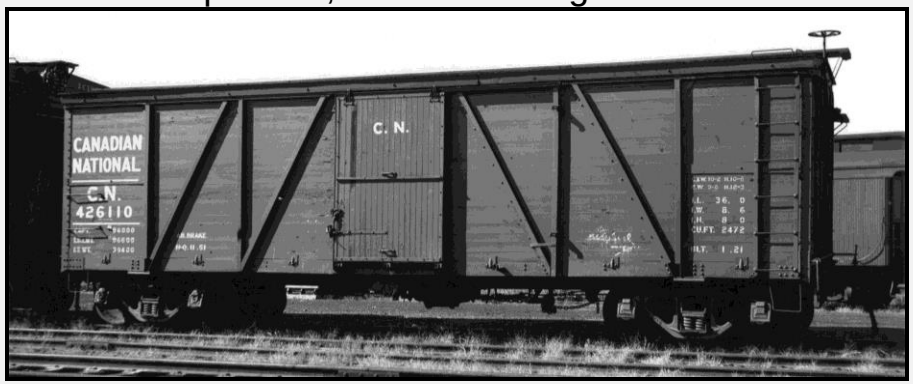
The patent SUBMISSION date is key: legally, priority is given to the submission date in any patent dispute. Fowler learned this the hard way in 1917, when the US Supreme Court ruled against him in exactly this situation (ruling #721).

WHAT IS A “FOWLER” SINGLE SHEATHED BOXCAR?

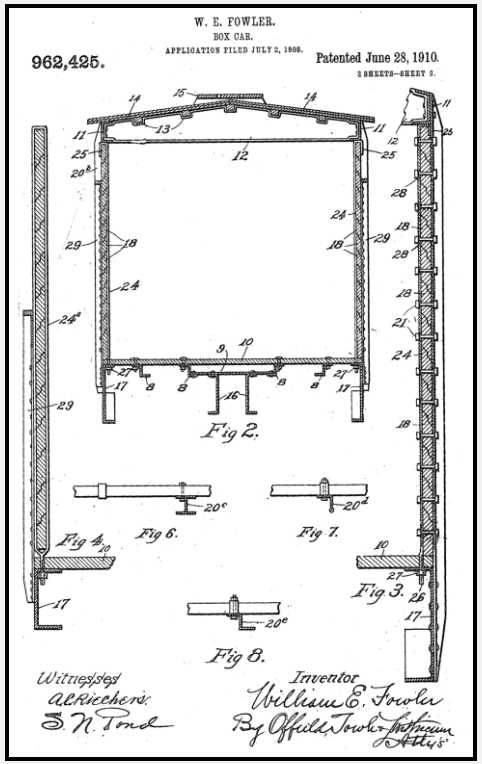
Saying “single sheathed boxcar” is like saying “all steel boxcar”. There are lots of different types.

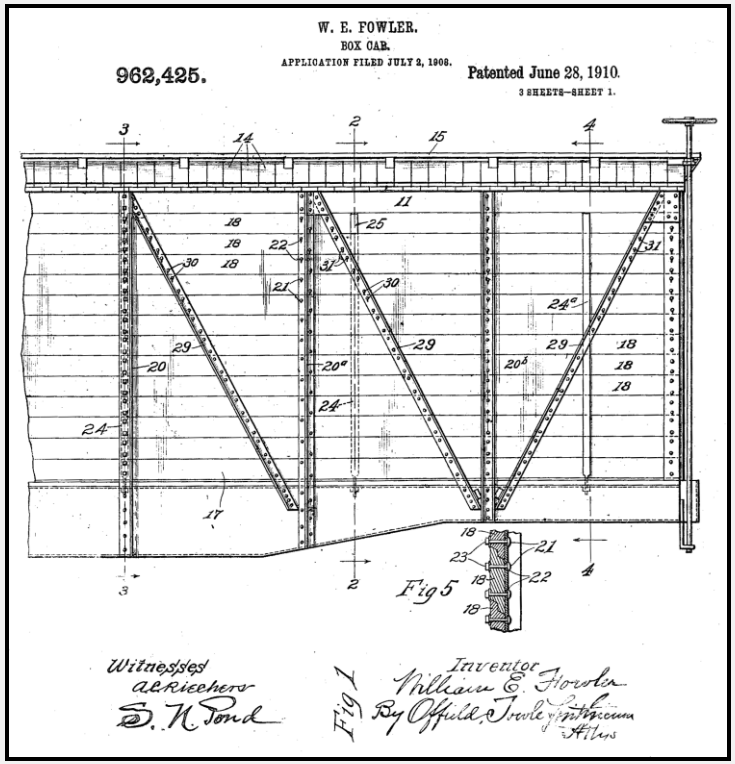


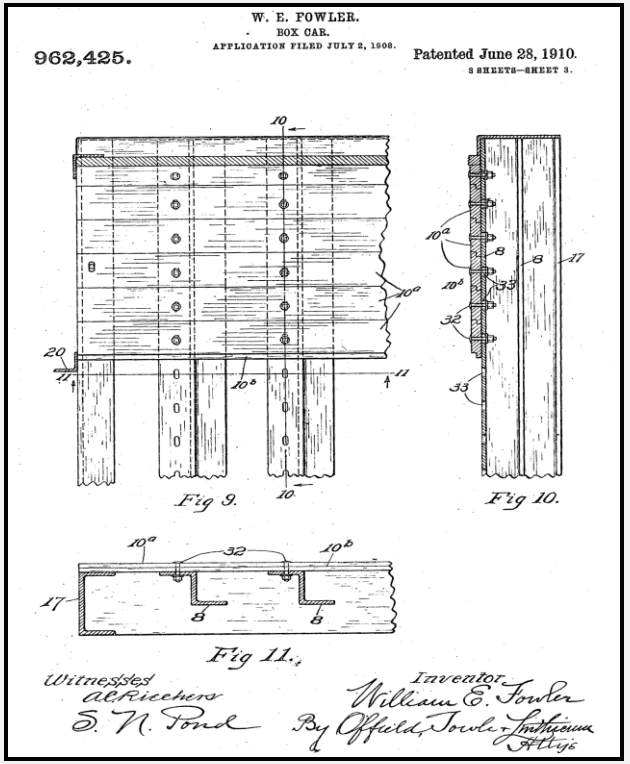
So what makes a Fowler a Fowler?
For that we have to look at the patents, as well as single sheathed boxcars built before 1916.



The drawings of Fowler's original boxcar patent (US962425) show what we would consider to be a pretty conventional single sheathed boxcar, with a steel underframe made of C-channels, C-channel side sills (shown in the drawings with a "fishbelly" profile, but almost never built with them), and walls made of dimensional steel ribs and long, horizontal wooden boards.



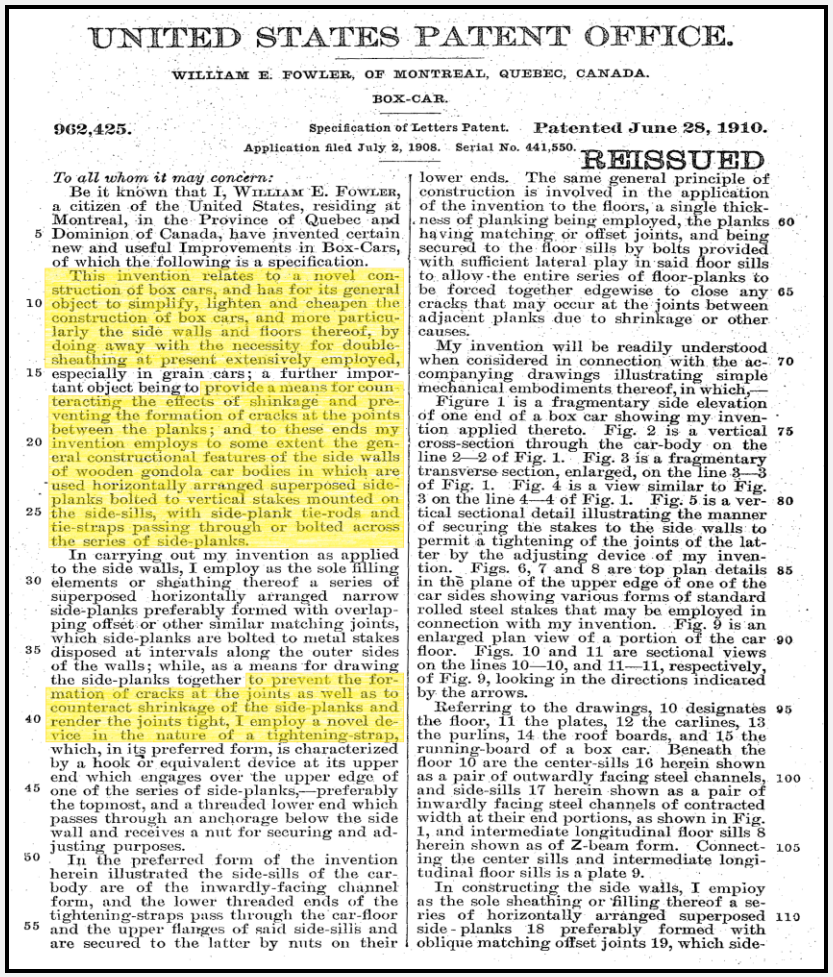




Notice that the body ribs are shown as L-channel. While Fowler did prefer L-channels for his designs, he does mention that Z-bars could also be used, as seen in Figure 11. And in fact, all Fowler-type boxcars were built with Z-bar body framework.

Also note Figure 1 item 24, which are the infamous "side wall tightening straps", and Figure 9, which shows the side walls bolted to the framing with "slotted holes". The holes were used on early Fowlers, but the straps were not.

The text of the patent explains the drawings, and makes several claims associated to the patent.



UNITED STATES PATENT OFFICE.

WILLIAM E. FOWLER, OF MONTREAL, QUEBEC, CANADA.

BOX-CAR.

962,425. Specification of Letters Patent. Patented June 28, 1910.

Application filed July 2, 1908. Serial No. 441,550.

REISSUED

To all whom it may concern:

Be it known that I, WILLIAM E. FOWLER, a citizen of the United States, residing at Montreal, in the Province of Quebec and Dominion of Canada, have invented certain new and useful Improvements in Box-Cars, of which the following is a specification.

This invention relates to a novel construction of box cars, and has for its general object to simplify, lighten and cheapen the construction of box cars, and more particularly the side walls and floors thereof, by doing away with the necessity for double-sheathing at present extensively employed, especially in grain cars; a further important object being to provide a means for counteracting the effects of shinkage and preventing the formation of cracks at the points between the planks; and to these ends my invention employs to some extent the general constructional features of the side walls of wooden gondola car bodies in which are used horizontally arranged superposed side-planks bolted to vertical stakes mounted on the side-sills, with side-plank tie-rods and tie-straps passing through or bolted across the series of side-planks.

In carrying out my invention as applied to the side walls, I employ as the sole filling elements or sheathing thereof a series of superposed horizontally arranged narrow side-planks preferably formed with overlapping offset or other similar matching joints, which side-planks are bolted to metal stakes disposed at intervals along the outer sides of the walls; while, as a means for drawing the side-planks together to prevent the formation of cracks at the joints as well as to counteract shrinkage of the side-planks and render the joints tight, I employ a novel device in the nature of a tightening-strap, which, in its preferred form, is characterized by a hook or equivalent device at its upper end which engages over the upper edge of one of the series of side-planks,—preferably the topmost, and a threaded lower end which passes through an anchorage below the side wall and receives a nut for securing and adjusting purposes.

In the preferred form of the invention herein illustrated the side-sills of the car-body are of the inwardly-facing channel form, and the lower threaded ends of the tightening-straps pass through the car-floor and the upper flanges of said side-sills and are secured to the latter by nuts on their lower ends. The same general principle of construction is involved in the application of the invention to the floors, a single thickness of planking being employed, the planks having matching or offset joints, and being secured to the floor sills by bolts provided with sufficient lateral play in said floor sills to allow the entire series of floor-planks to be forced together edgewise to close any cracks that may occur at the joints between adjacent planks due to shrinkage or other causes.

My invention will be readily understood when considered in connection with the accompanying drawings illustrating simple mechanical embodiments thereof, in which,—

Figure 1 is a fragmentary side elevation of one end of a box car showing my invention applied thereto. Fig. 2 is a vertical cross-section through the car-body on the line 2—2 of Fig. 1. Fig. 3 is a fragmentary transverse section, enlarged, on the line 3—3 of Fig. 1. Fig. 4 is a view similar to Fig. 3 on the line 4—4 of Fig. 1. Fig. 5 is a vertical sectional detail illustrating the manner of securing the stakes to the side walls to permit a tightening of the joints of the latter by the adjusting device of my invention. Figs. 6, 7 and 8 are top plan details in the plane of the upper edge of one of the car sides showing various forms of standard rolled steel stakes that may be employed in connection with my invention. Fig. 9 is an enlarged plan view of a portion of the car floor. Figs. 10 and 11 are sectional views on the lines 10—10, and 11—11, respectively, of Fig. 9, looking in the directions indicated by the arrows.

Referring to the drawings, 10 designates the floor, 11 the plates, 12 the carlines, 13 the purlins, 14 the roof boards, and 15 the running-board of a box car. Beneath the floor 10 are the center-sills 16 herein shown as a pair of outwardly facing steel channels, and side-sills 17 herein shown as a pair of inwardly facing steel channels of contracted width at their end portions, as shown in Fig. 1, and intermediate longitudinal floor sills 8 herein shown as of Z-beam form. Connecting the center sills and intermediate longitudinal floor sills is a plate 9.

In constructing the side walls, I employ as the sole sheathing or filling thereof a series of horizontally arranged superposed side-planks 18 preferably formed with oblique matching offset joints 19, which side-

planks are secured to a series of upright stakes, which latter are bolted or riveted at their lower ends to the outer sides of the side-sills 17. These stakes are preferably steel bars of standard rolled forms, any of which having a member parallel with the plane of the side-planks and another member at an angle thereto for stiffening purposes may be employed. In Fig. 1 I have shown at 20 an angle-bar form of stake, at 20^a a T-form, and at 20^b a channel-form. In Fig. 6 I also show an I-form 20^c, in Fig. 7 an angle-form 20^d provided with a bead on its outer edge, and in Fig. 8 a Z-form at 20^e. These stakes, as shown in the detail view, Fig. 5, are secured to the side-planks by bolts 21 which pass through short vertical slots 22 in that member of the stake lying flat against the side-planks and through holes in the side-planks, being secured by nuts 23 on their inner ends. It will be observed that this construction affords to the side-planks a capacity for a limited vertical movement relatively to the stakes.

I have herein illustrated two forms of my improved tightening-strap, either or both of which may be employed to satisfactorily effectuate the purposes of the invention. In Figs. 1, 2 and 3 I show a tightening-strap 24 that extends transversely of the side-planks, lying snugly against the inner sides of the latter, and is provided at its upper end with an outwardly and downwardly turned hooked portion 25 that engages over the uppermost of the series of side-planks 18. The lower end of this tightening-strap is rounded and threaded, as shown at 26, and extends through a hole in the car-floor 10, and, where used in association with a steel side-sill having a laterally projecting upper flange, such as the channel-sill 17, likewise extends through an aperture in said upper flange and is secured by a nut 27 beneath said flange. The other form of tightening-strap illustrated in Figs. 1 and 4 differs from that above described in that the main body portion of the strap is formed as a complete elongated loop 24^a completely embracing the series of side-planks at the top, bottom, and on both sides, said tightening strap being secured at its lower end by the means and in the manner shown in Fig. 3. These tightening-straps may be applied to the side walls of the car at points between adjacent stakes, as shown at the center and at the right in Fig. 1 and in Fig. 2;—or, they may be applied directly opposite a stake, as shown in Fig. 3 and at the left in Fig. 1; in which latter case the longitudinal member or members of the strap that engage the side-planks are, like the stakes, provided with narrow vertical slots 28 to receive the bolts 21.

From the foregoing it will be evident that by screwing up the adjusting nuts 27, the tightening-straps are drawn downwardly, thus drawing together the superposed series of side-planks and rendering perfectly tight the joints between the latter. The vertical slotting of the stakes where the bolts 21 pass therethrough permits such downward adjustment of the side-planks; and the similar slotting of the tightening-straps 24, where located in the transverse planes of the stakes, likewise permits such downward movement of the tightening-straps in the adjustment. This adjustment not only produces a tight construction of side wall in the first instance, but, in case the side-planks shrink, thus tending to open the joints between them, such open joints can be easily and quickly closed by further adjustment of the tightening-straps.

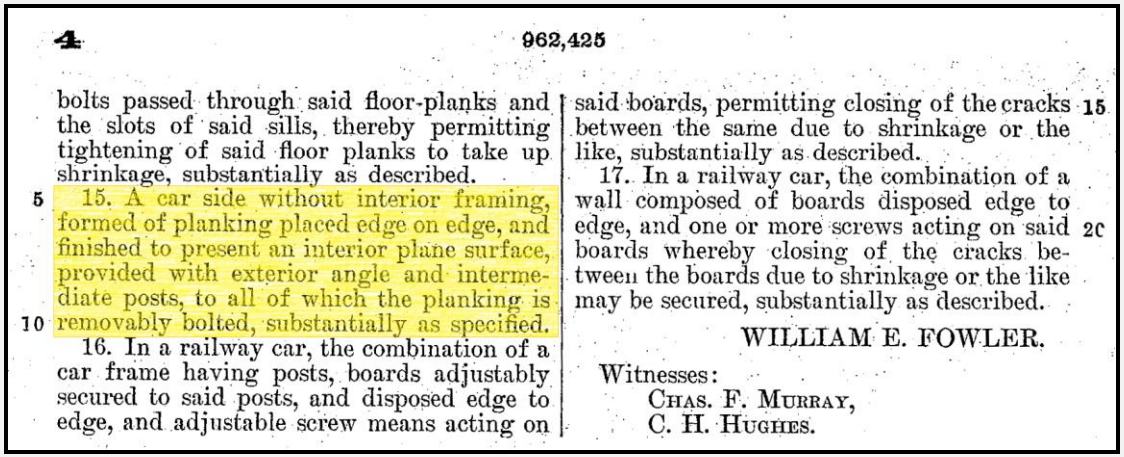
Between the stakes may be applied the usual oblique braces 29 herein shown as of angle-bar formation secured to the horizontal planks of the sheathing by bolts 30; and to accommodate the contracting movement of the sheathing, the holes in the braces accommodating the bolts 30 are elongated vertically, as indicated at 31 in Fig. 1. In this connection it may be noted that, since the extent of downward movement of the planks 18 under the action of the tightening-straps is greatest at the top and diminishes to practically nothing at or near the bottom of the wall, the slotting of the stakes and braces will be greatest at or near the upper end and may diminish and disappear at or near the lower end of the wall. In Figs. 9, 10 and 11 I have illustrated the application of this principle to the floor construction of the car, although I have not shown the latter as equipped with the tightening-straps, since the tightening effect may be otherwise secured. Referring to these figures, it will be observed that the individual planks 10^a of which the floor is composed rest transversely of and upon the upper horizontal flanges of the longitudinal floor bars 8 and side sills 17 and are secured thereto by means of bolts 32, which pass through slots 33 formed in and longitudinally of the upper flanges of the floor beams. The planks are formed preferably with matching offset joints 10^b, as shown; and, in the event of any shrinking of the floor planks such as would produce an objectionable crack between them, by simply slightly loosening the nuts on the securing bolts 32 and applying a crow-bar or similar tool to the end planks of the series or between any two of the planks, the latter may be forced into snug edgewise engagement, closing up any cracks that may occur at the matching joints; while the crack at the point where the tightening tool is applied may be filled in and closed in any suitable manner.

My invention is particularly useful in cars intended for the transportation of grain; and it is noteworthy that the tightening-straps not only serve at all times as a means

Lines eight through 14 show the intent of Fowler: to create a cheap, light, and durable boxcar by doing away with the exterior sheathing. When the patent was written and submitted, no house cars were built this way.

The bulk of Fowler's patent does try to explain how he attempts to deal with boxcar leakage, by creating a means of tightening the sides as they shrink. As these were initially to be Canadian Pacific cars intended for bulk grain lading, leaky cars were an important consideration.

The "claims" section of the patent deal with many design elements that Fowler said were unique. Besides staggered joints on the horizontal sheathing, an exterior metal framework, and various methods to tighten the side sheathing, is claim #15:



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bolts passed through said floor-planks and the slots of said sills, thereby permitting tightening of said floor planks to take up shrinkage, substantially as described.

15. A car side without interior framing, formed of planking placed edge on edge, and finished to present an interior plane surface, provided with exterior angle and intermediate posts, to all of which the planking is removably bolted, substantially as specified.

16. In a railway car, the combination of a car frame having posts, boards adjustably secured to said posts, and disposed edge to edge, and adjustable screw means acting on said boards, permitting closing of the cracks between the same due to shrinkage or the like, substantially as described.

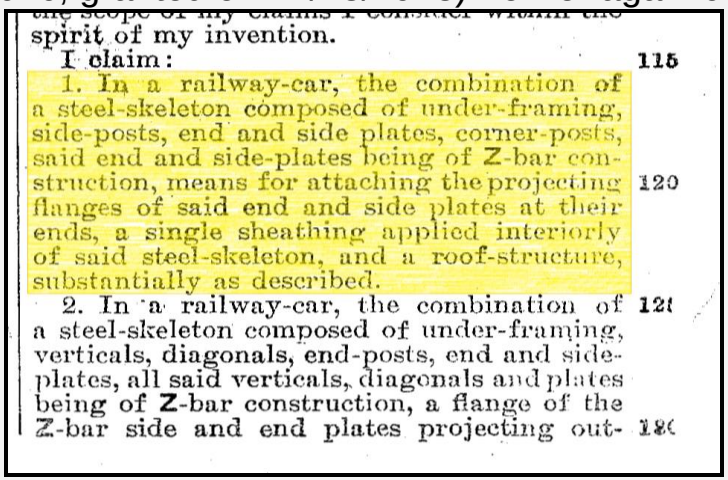
17. In a railway car, the combination of a wall composed of boards disposed edge to edge, and one or more screws acting on said boards whereby closing of the cracks between the boards due to shrinkage or the like may be secured, substantially as described.

WILLIAM E. FOWLER.

Witnesses:
CHAS. F. MURRAY,
C. H. HUGHES.

So as part of Fowler's patent, he claims that single sheathing is "his idea".
Fowler also applied for a Canadian patent using the same text and drawings as the US Patent.
CA122944 was submitted on 8/27/1909, and issued on 12/28/1909.

In a later patent (US1078616, granted on 11/18/1913) Fowler again claims the idea as his own.



spirit of my invention.

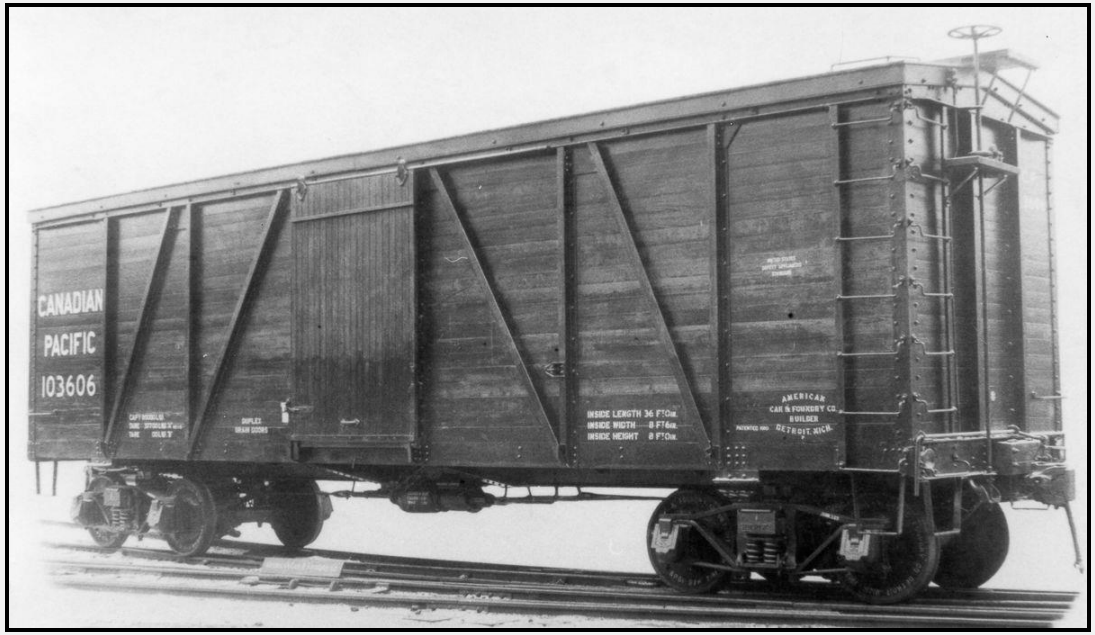
I claim:

1. In a railway-car, the combination of a steel-skeleton composed of under-framing, side-posts, end and side plates, corner-posts, said end and side-plates being of Z-bar construction, means for attaching the projecting flanges of said end and side plates at their ends, a single sheathing applied interiorly of said steel-skeleton, and a roof-structure, substantially as described.

2. In a railway-car, the combination of a steel-skeleton composed of under-framing, verticals, diagonals, end-posts, end and side-plates, all said verticals, diagonals and plates being of Z-bar construction, a flange of the Z-bar side and end plates projecting out-

THE FIRST FOWLERS – THE CANADIAN PACIFIC CARS

Canadian Pacific



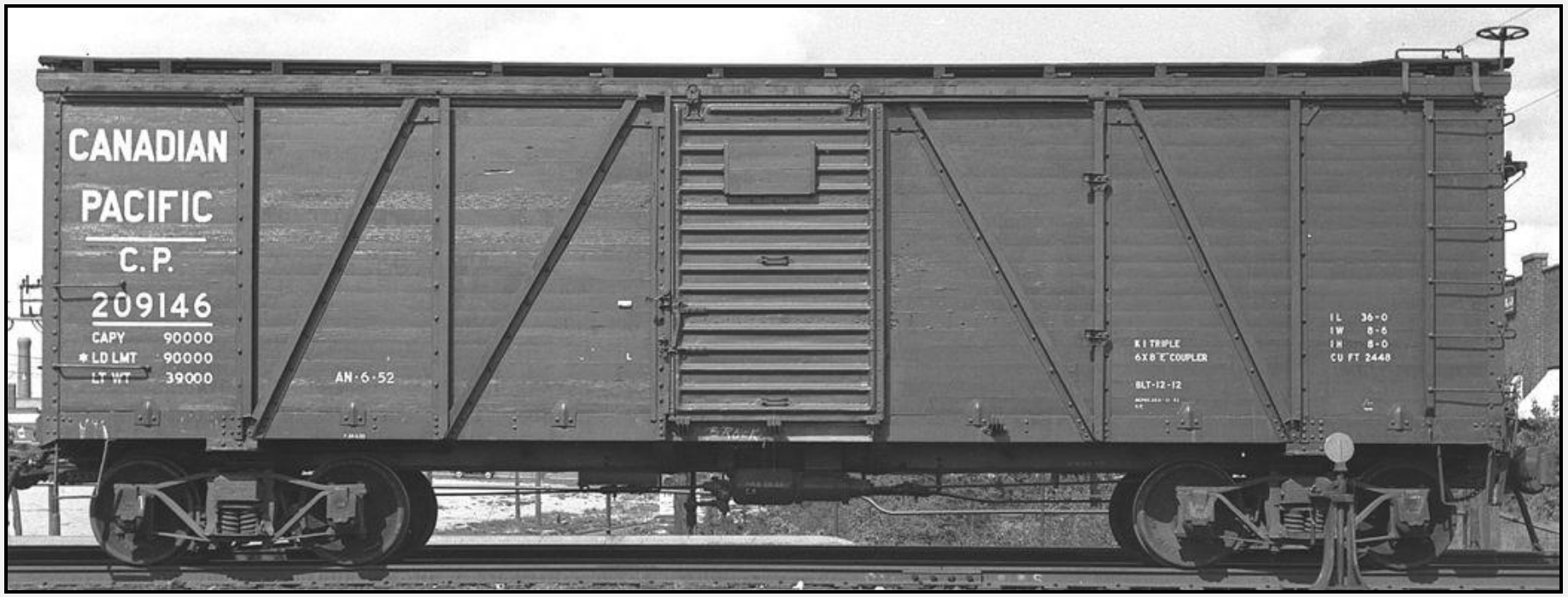
The Canadian Pacific cars were specifically built as grain transporting freight cars. Canadian railroad traffic was dominated by high bulk, low revenue wheat tonnage, and the CP needed an economical way to move it. They found the solution with the Fowler-designed cars, and began building them in huge numbers, ultimately building more than 52,000 examples. All of their cars featured 5-foot wide doors, but had a variety of end styles when built (two, three or four vertical braces, and diagonal braces on the early prototypes). And while they were all built with either double layer wood or inside steel roofs, various modernization programs saw many rebuilt with outside metal roofs of at least two styles, as well as Youngstown doors and cast steel sideframe trucks. These cars lasted an astonishingly long time, with a few stragglers lasting into 1981.

100000-139998, various builders between 1909-1913. 40,000 cars.
200000-212499, various builders between 1910-1914. 12,500 cars.
213000-213249, ACF 1914. 250 cars.
170000-189999, renumber series for cars when modernized. Last cars gone by 1981.

5


CANADIAN
PACIFIC
C.P.
123456
CAPY 80000
LD LMT 96200
LT WT 39800


CANADIAN
PACIFIC
C.P.
181101


CANADIAN
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209146
CAPY 90000
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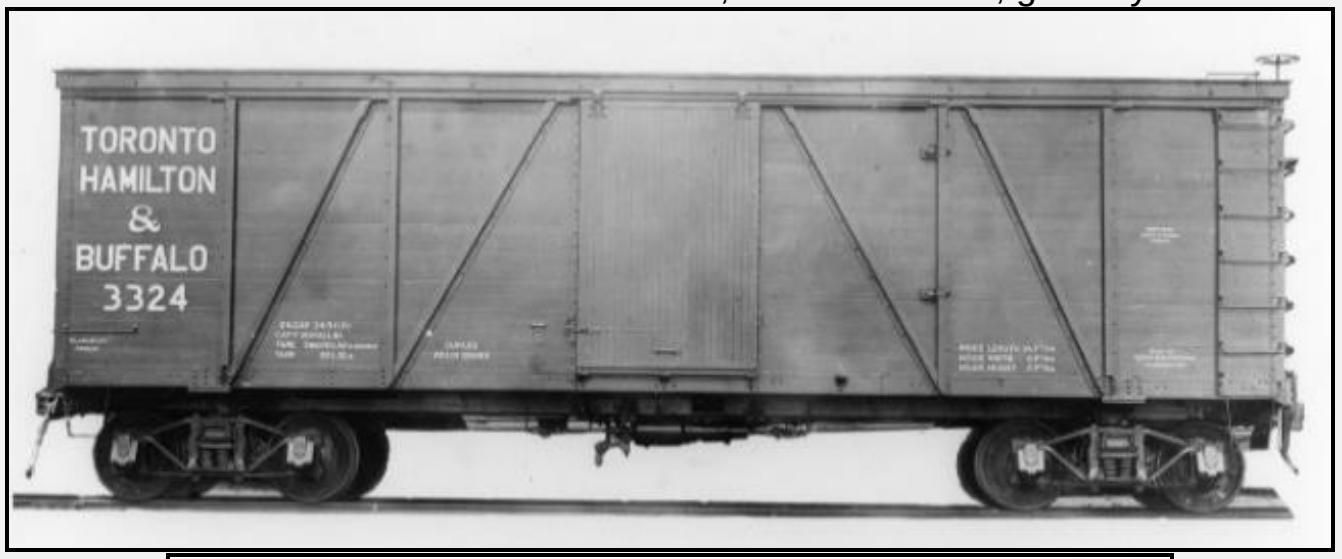
LT WT 39000
AN-6-52
K-1 TRIPLE
6X8 "E" COUPLER
BLT-12-12
IL 36-0
IW 8-6
IH 8-0
CU FT 2448

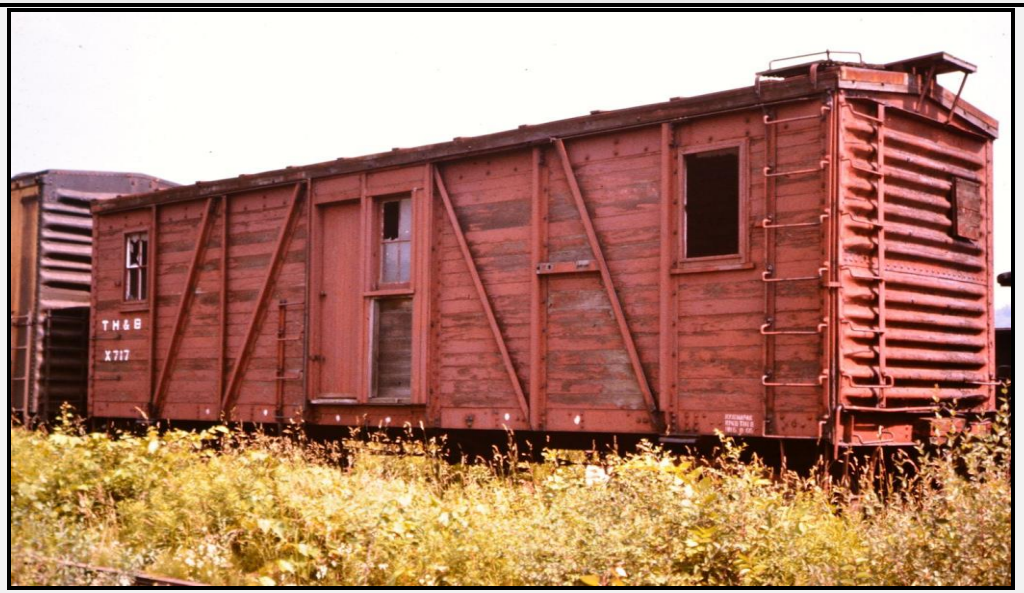
THE FAMOUS “SLOTTED HOLES”

Toronto, Hamilton & Buffalo

3000-3999, assorted builders and dates. 965 cars in 1930, gone by 1950.

4000-4299, assorted builders and dates. 0 cars in 1930, 81 cars in 1950, gone by 1955.

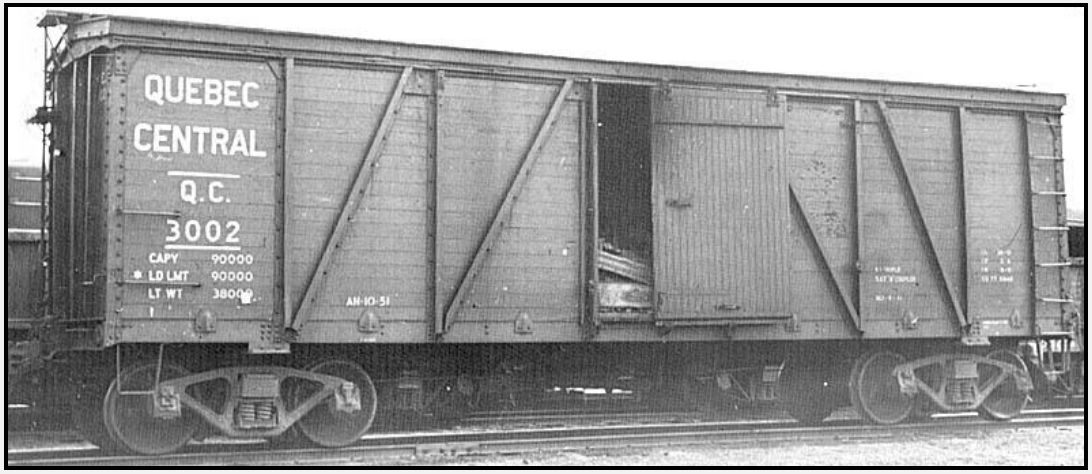




A CP subsidiary, the parent of the TH&B assigned assorted Canadian-standard Fowlers to the road to cover local traffic as needed. The 3000-series group of cars were completely as-built, while the 4000 series were modernized with outside metal roofs and cast sideframe trucks.

Quebec Central

2900-3198, various builders and dates. 0 cars in 1930, 75 cars in 1950, 1 car in 1959 (#3064).



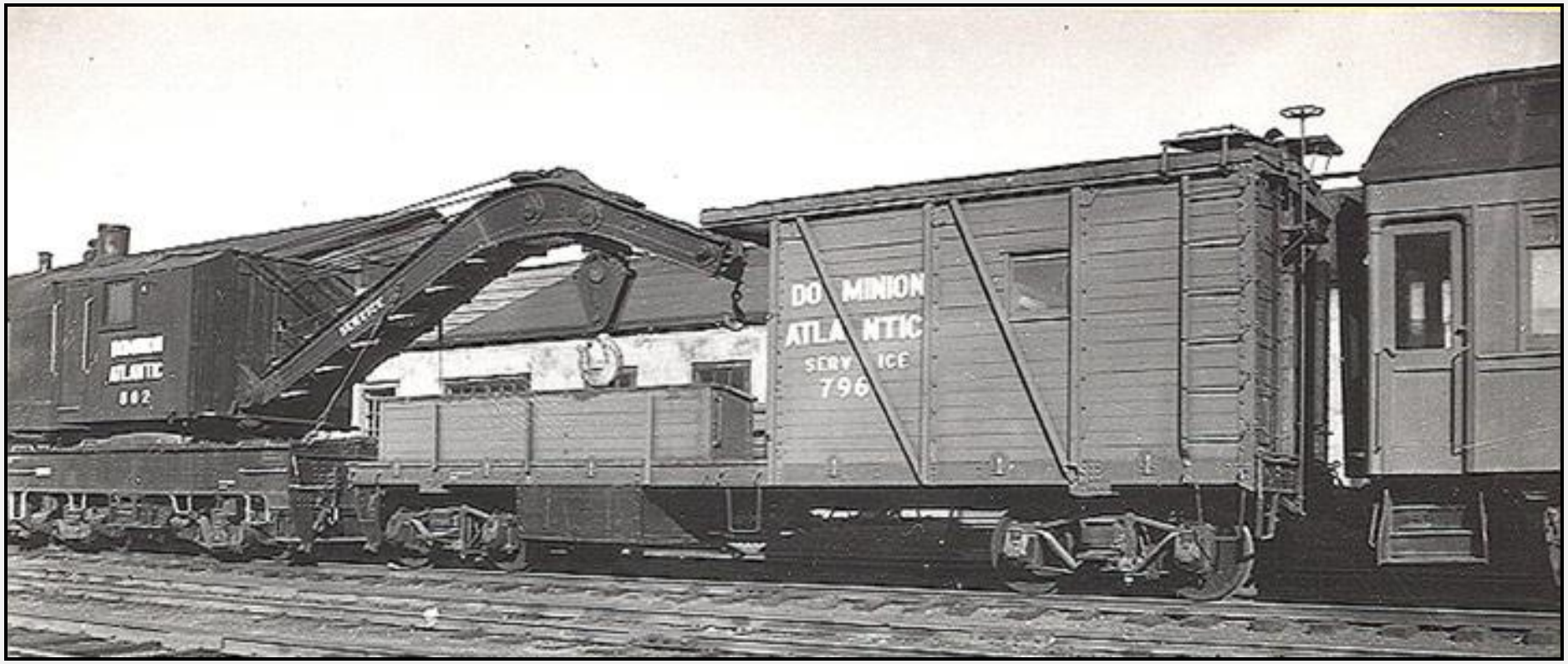
The QC was another subsidiary road of the CP, and the parent road usually assigned a few cars to it over the years.

Montreal & Atlantic

Another CP subsidiary road, the M&A owned a small number of Fowlers (less than 100). No car series or quantities are indicated in any ORER listing, so the overall number of these cars is unknown. Based on the above builder's photo the M&A cars were part of the CP's 213000-series.

Dominion Atlantic

1400-1450, assorted builders and dates. Cars gone by 1950.



The DAR was purchased by the Canadian Pacific in 1912, but kept its corporate identity through the 1940s. After WWI the CP transferred a few of its common Fowler boxcars to the DAR. Placed in the 1400 series, there were only two cars left on the roster by the end of WWII.

THE CANADIAN GOVERNMENT FOWLERS

Grand Trunk

The Grand Trunk was a sprawling railroad covering southern Canada and the northern United States, and had a larger freight car fleet at the beginning of WWI than most modelers imagine (just over 53,000 cars; the 15th largest fleet in North America). While a large amount of their traffic came from the industrial centers of Chicago and Detroit, and in bridge traffic to Canada, the railroad also did its fair share of moving Canadian grain. It was probably natural that the GT would follow the example of the CP and buy examples of the Fowler boxcars, but because of the large amount of finished goods that the road carried they opted to buy 6' door cars.

24500-26499, Pressed Steel 1912/1913, 2000 cars.
100000-102999, WSC&F 1913/1914, 3000 cars
103000-104999, CC&F 1913, 2000 cars
105000-105599, Eastern Car Co. 1913, 600 cars
105600-106999, Eastern Car Co. 1913, 1400 cars
107001-107009, WSC&F 1914, 9 cars
107100-108099, ACF 1917/1918, 1000 cars
All rolled into the CN roster by 1922. 209 cars still lettered for the GT in 1930.

The Grand Trunk overextended itself financially by attempting to become a transcontinental railroad with the construction of their Grand Trunk Pacific subsidiary (which never owned Fowler-type boxcars), and its ensuing bankruptcy was a major factor in the Canadian government's decision to nationalize many struggling railroads under a single line. The Canadian government nationalized many failing railroads during WWI, and the GT cars represented over a third of the new Canadian National's giant Fowler boxcar fleet.

GT 106926 is in Toronto in 1927, during the early years of the GTW.

Intercolonial RR

61643-61922, 1912, 280 cars.
61973-62345, 1912, 373 cars.
62396-63395, 1913, 1,000 cars.
63646-64145, 1913, 500 cars.
80801-81610, 1914, 810 cars.
81611-84610, 1914, 3,000 cars.
5,963 cars total.

The Intercolonial's fleet of Fowler boxcars were all based on the Canadian Pacific car design, including 5-foot wide doors. Built just before WWI these cars were rolled into the Canadian Government Railway's fleet in 1918, which was later reorganized into the Canadian National in 1923. These 5,900 cars formed the bulk of the CN's 5-foot door Fowler fleet.

Canadian Government Railway

250000-250999, CC&F 1916, 1,000 cars.
550000-554999, CC&F 1917, 5,000 cars.
Plus some assorted cars relettered from the bankrupt GTR, INT, CNOR, and other roads.

The CGR was formed in 1915 to preserve essential rail services of bankrupt railroads in Canada during a time of extreme national crisis. The short-lived railroad was reorganized into the CN in 1923. The railroad did build 6,000 short Fowlers (and some 40-foot versions as well) during WWI, and those cars became part of the CN's 5-foot Fowler fleet. These Fowlers seem to have been repeat orders of Intercolonial boxcars.

Canadian National

CN car with six foot door. The cars was built in 1923, and by the time of this 1957 photo had been modernized with an outside metal roof, cast steel trucks, and AB brakes.

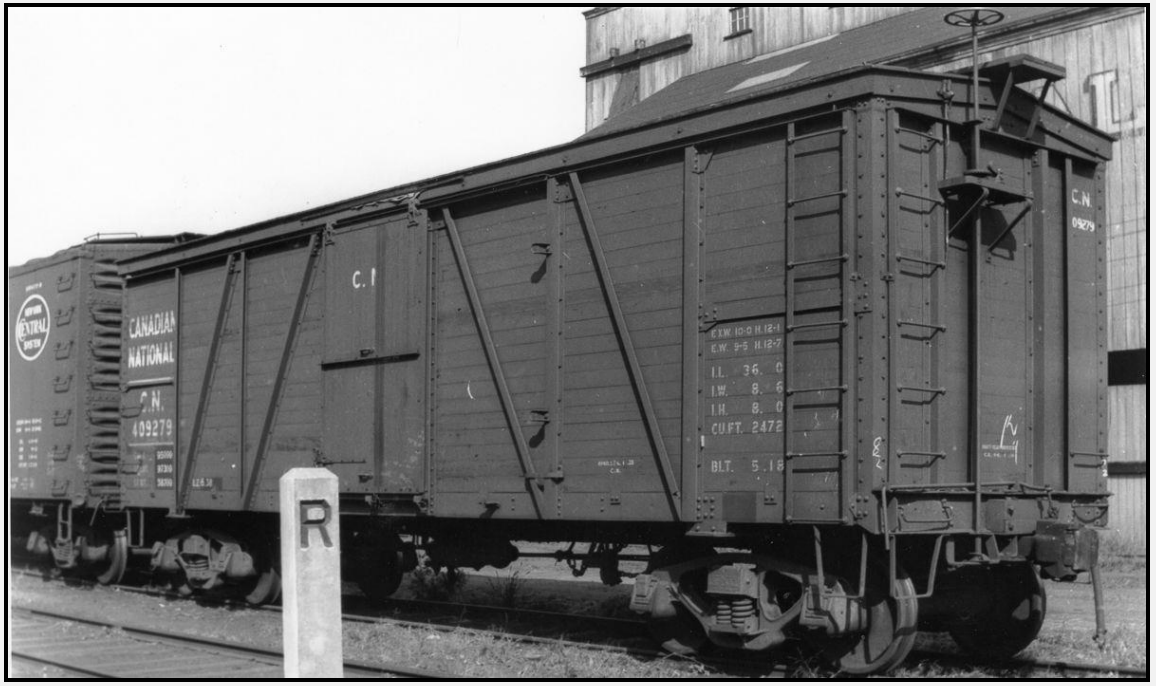
The Canadian National is a relatively young railroad, having been created in 1923 as a government-owned consolidation of several bankrupt railroads, most significantly the Grand Trunk and Canadian Northern.

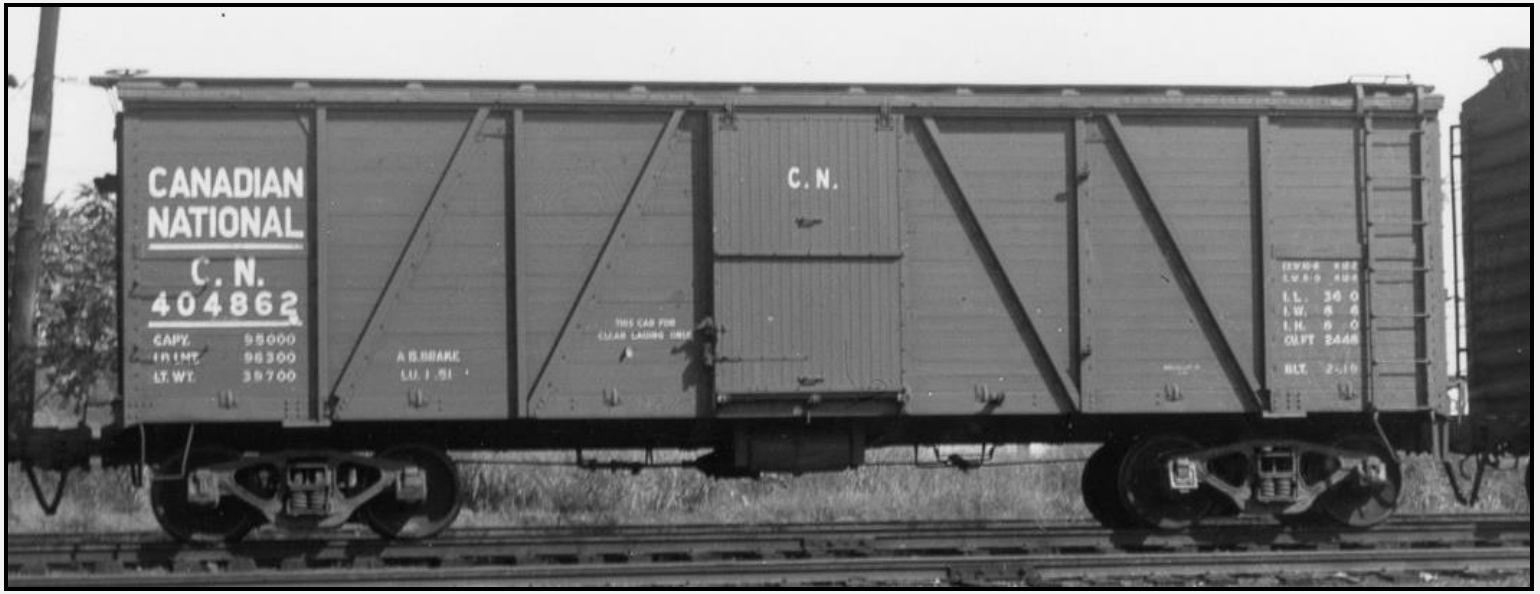
The CN inherited Fowlers from several of these bankrupt railroads, and built new Fowlers after being created, and owned both 5’ and 6’door cars as well as 36-and 40-foot long cars.

SIX FOOT DOOR CARS:
344700-346699, former GT 24500-26499 built 1912/1913, 2,000 cars.
420150-422149, former GT 103000-104999 built 1913, 2,000 cars.
422150-422749, former GT 105000-105599 built 1913, 600 cars.
429000-430399, former GT 105600-106999 built 1913, 1,400 cars.
430400-430408, former GT 107001-107009 built 1914, 9 cars.
430500-431499, former GT 107100-108099 built 1917/1918, 1,000 cars.
426500-426999, Eastern Car Co. 1923, 500 cars.
427000-427999, National Steel Car Co. 1923, 1,000 cars.
428000-428999, CC&F 1923, 1,000 cars.

FIVE FOOT DOOR CARS:
402000-417149, former Canadian Northern and Intercolonial cars, built 1918/1919, 15,150 cars.
422750-726499, former Canadian Government Railway cars, built 1920/1921, 3,750 cars.

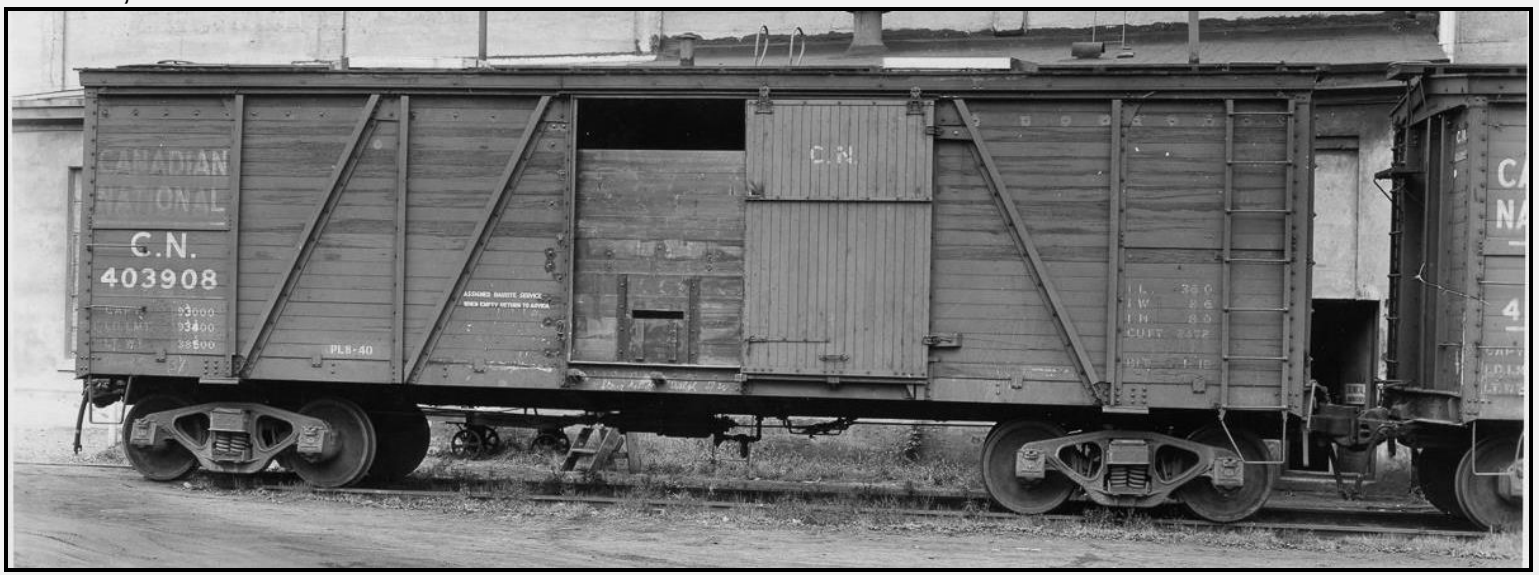
OTHER:
516000-516242, a new number series for all remaining Fowlers, created in the mid-1960s. 58 cars in 1970, 54 cars in 1972, 12 cars in 1975, 6 cars in 1979. The last car on CN roster was six foot door car #516196, retired in late 1981.



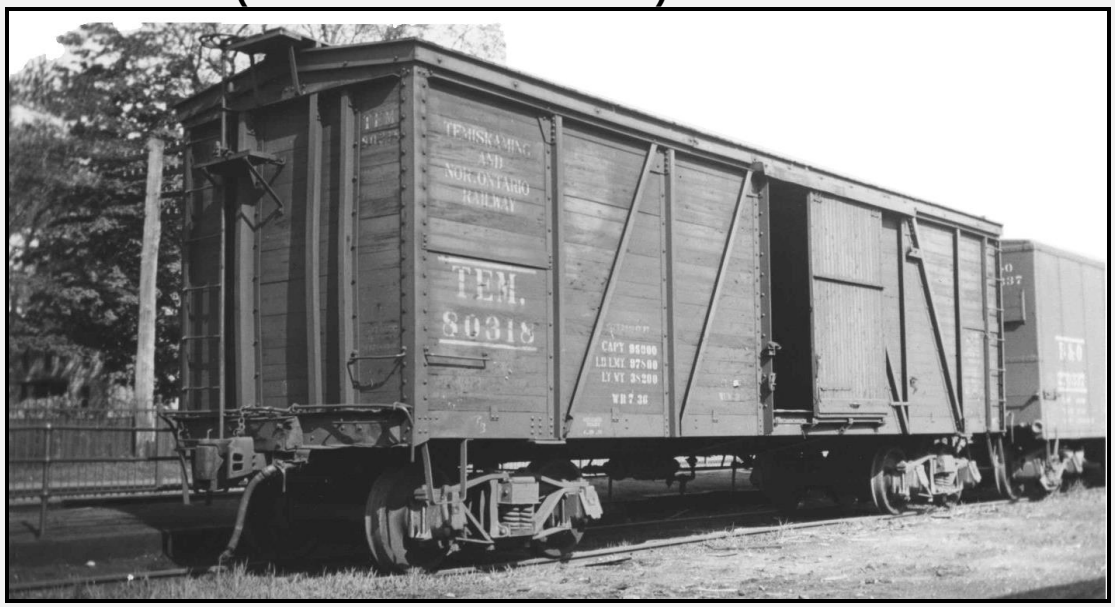


CN short Fowler with five foot wide door.

Overall, the CN ended up with 18,900 5-foot door cars and 9,509 6-foot cars, or 28,409 short Fowlers total. CN cars don't seem to have been upgraded a whole lot, besides new outside metal roofs in the 1930s, cast steel sideframe trucks in the 1940s, and AB brakes in the 1950s.



Temiskaming and Northern Ontario (later Ontario Northland)



80200-80398 (even numbers), built 1919. 96 cars in 1926, 52 in 1950, 23 in 1959, gone by 1972.
80400-80498 (even numbers), built 1921. 50 cars in 1926, 37 in 1950, 10 in 1959, gone by 1972.

Pacific Great Eastern

3500-3599, Unknown builder, 3/1914. 49 cars in 1930, 44 in 1950, gone by 1955.

The PGE purchased a small number of Fowlers, which look to be copies of conventional Canadian Pacific cars with 5-foot door openings.

THE AMERICAN FOWLER BOXCARS

Production of the Fowler boxcar type was brisk in the years just before World War One, and by 1915 over 75,000 cars had been built to the same general plans. The car design was soon overshadowed by a larger Bettendorf designed single sheathed boxcar in 1916 and by the USRA's single sheathed car in 1918. But there were still around 100,000 Fowler-type boxcars on North American railroads through most of the 20th Century. By comparison, there were only 25,000 USRA single sheathed boxcars built. And the little cars were very long-lived: the last revenue service short Fowlers didn't come off the CN and CP revenue rosters until 1981, and some Fowlers continued working for various railroads in maintenance of way service through the 1990s.

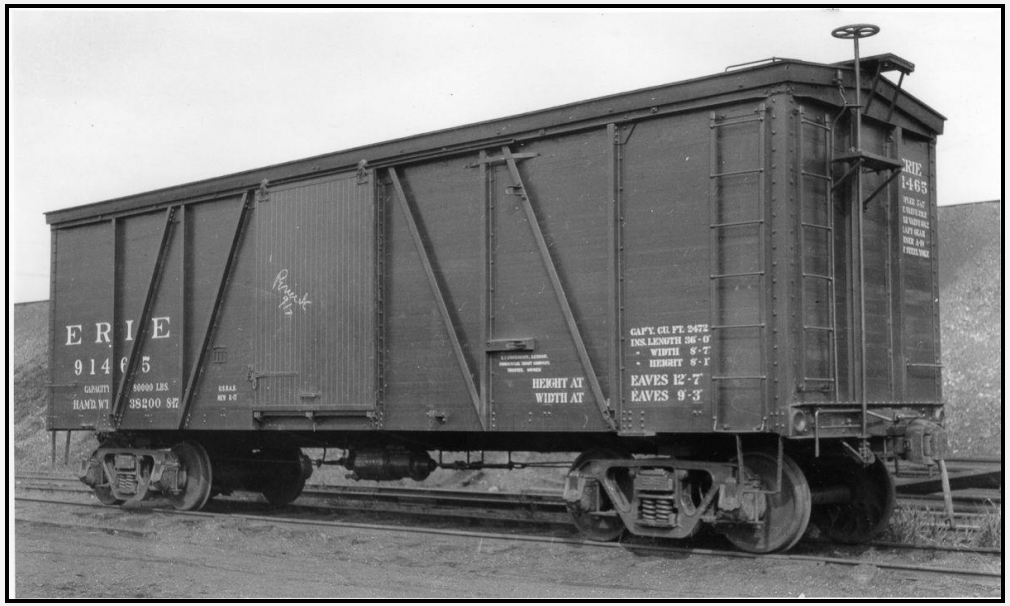
Compared to Canada, the railroads of the United States didn't buy as many Fowler-type boxcars, with only about 17,600 short and 15,000 40-foot cars built. Most short American Fowlers were built in the four years before WWI, while the longer cars were soon eclipsed by larger, stronger designs. They also didn't last nearly as long, with only the Soo Line's "sawtooth Fowlers" lasting into the 1960s.

Soo Line

12800-14298 (evens), ACF 1912, 750 cars.

The first American Fowlers built were 750 cars for the Soo Line, which were identical to Canadian Pacific cars. These cars were quickly overshadowed by the road's signature 40-foot sawtooth cars ordered just one year later, but the 36-foot cars were just as long lived. 730 of the cars were still on the roster at the beginning of the Depression in 1930, there were 288 on the roster in 1955, and 17 in 1960.

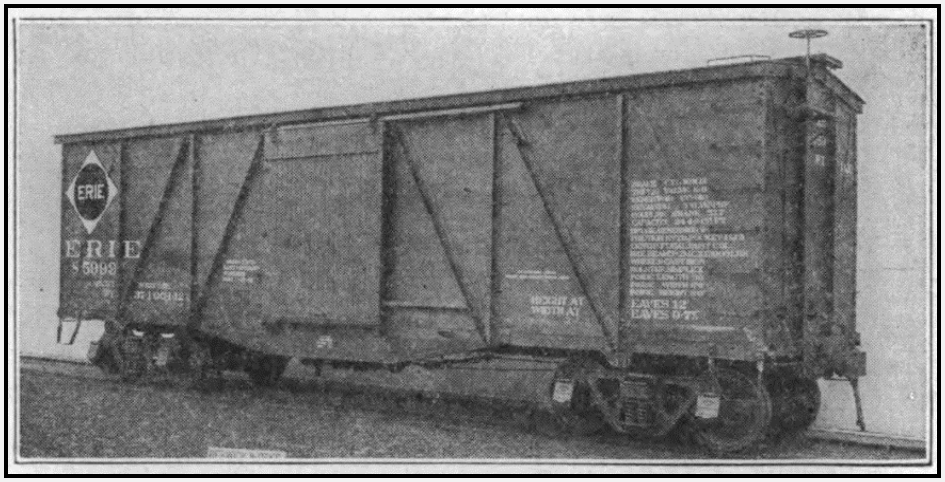
Erie



The Erie Railroad owned the fourth largest fleet of short Fowlers (third, once the Grand Trunk became part of the CN). Al Westerfield suggests that the railroad purchased so many of the cars because the company's president, Frederick Underwood, worked for the Canadian Pacific and helped create the Soo Line, and kept track of what his former employers were doing. When he saw thousands of progressive, sturdy and relatively inexpensive boxcars being built for both of his former railroads, he wanted them too.

Over the span of eight years, the Erie purchased 8,550 short Fowlers, as well as 1,500 40-foot and 75 50-foot "semi Fowler clones". Like the Canadian Pacific, the Erie's cars had many different small variations.

85000-85999, ACF 1912, 1,000 cars. 479 in 1930, gone by 1945.
86000-87499, WSC&F 1913, 1,500 cars.
87500-88999, ACF 1913, 1,500 cars.
89000-90499, SSCC 1913/1914, 1,500 cars.
90500-91499, SSCC 1917, 1,000 cars.
91500-92499, ACF 1917, 1,000 cars.
91551-91575, Erie Shops 1917, 25 cars (Wells Fargo express boxcars).
92475-92499, ACF 1917, 25 cars (Wells Fargo express boxcars).
All above: 6,138 cars in 1930, 8 in 1950, gone by 1955.
93000-93999, Pressed Steel 1920, 1,000 cars. 987 cars in 1930, 882 in 1950, 2 cars in 1959, gone by the end of 1960.



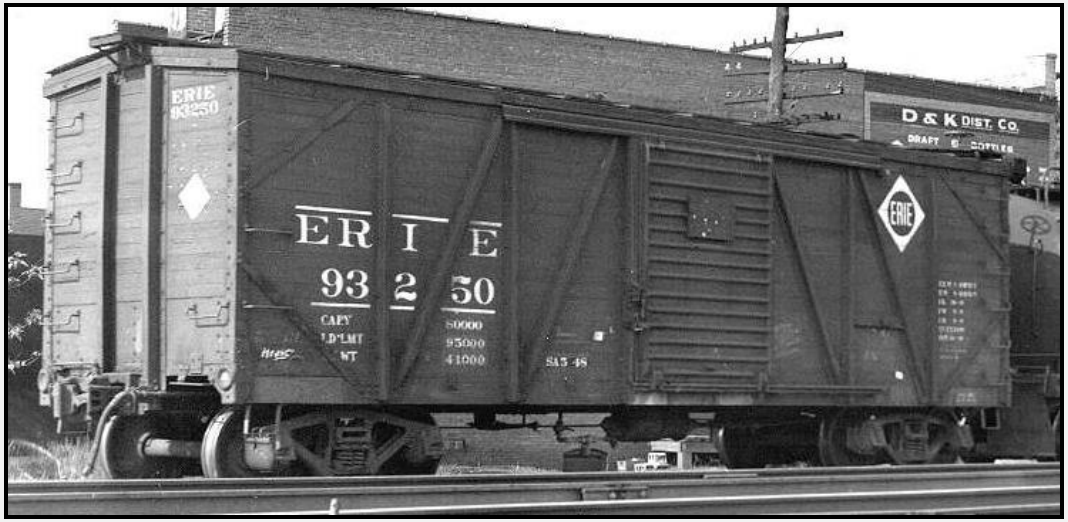
The first group of Erie Fowlers was the 85000-85999 series built by ACF's Berwick Shops in 1912. The cars appear to be similar to Canadian-built six-foot door Fowlers, but with short fishbelly stiffening plates under the door; the only Fowler cars built that matched the patent drawings. The cars also had grab irons leading to the roof rather than ladders.

The next group of Fowlers for the Erie were 4,500 cars built by three builders in 1913. These were completely typical Fowlers with two brace ends, much like the bulk of the Grand Trunk's cars. This view of Erie 86830 shows the car in 1938, a few years after receiving a new Murphy outside metal roof.

The Erie built another 2,050 Fowlers in 1917 that were virtual clones of the 1913-built cars. Starting in early 1926 many of these cars were rebuilt with an early version of Youngstown steel doors.

The final group of short Fowler-type cars were 1,000 built for the Erie by Standard Steel in 1920, ordered immediately after USRA control ended. The best known of the Erie type cars since they lasted the longest, the cars aren't really Fowlers at all, just cars that are thematically similar.

These cars diverged dramatically from the Fowler design in most ways, most apparently in their hat section braces, extra diagonal side braces at the end panels, and door guides. The cars were rebuilt with outside metal roofs and Youngstown doors in the mid-1930s, and while off the revenue roster by 1960 worked for the Erie-Lackawanna in MOW service and into the first years of Conrail.



New York, Susquehanna & Western

1500-1999, Standard Steel Car Co. 1913, 500 cars.

While under Erie ownership, the NYS&W received its largest group of identical steam-era freight cars, in the form of 500 Fowlers. Identical to the Erie's 89000-90499 series built the same year, except for the cut levers (Carmers on the Erie cars, plain bars for the NYS&W), the cars were used for everything on the railroad, including REA express service. 453 cars were on the roster in 1930, but the group was down to just 40 by 1950. 11 cars survived the road's bankruptcy in 1957, but were all scrapped by the early 1960s.

Wabash

75000-75699, ACF 1912
75700-76199, Haskell & Barker 1912
1,200 cars. 1,143 cars in 1930, gone by 1945.
76200-77199, ACF 1916, 1,000 cars. 970 cars in 1930, gone by 1945.
77200-78199, unknown builder, 1916/1917, 1,000 cars. 972 cars in 1930, gone by 1945.

The Wabash was an early adopter of the single sheathed car design, and owned 3,200 nearly identical short Fowlers built to two slightly different designs. While the Wabash returned to purchasing double sheathed boxcars during and immediately after USRA control, the road quickly re-adopted the single sheathed concept and began buying thousands of 40-foot long, single sheathed auto boxcars beginning in 1924. These cars quickly became the dominant boxcar type on the Wabash. Although their Fowler fleet survived intact into 1930 it's doubtful that more than a handful saw the beginning of WWII; photos of the cars are extremely rare after the mid-1920s.

Toledo, St. Louis & Western / Nickel Plate Road

7000-7999, H&B 1914, 1,000 cars. To NKP 97000-97999 in 1924, all repainted by 1930 & scrapped 1948.

The Clover Leaf bought 1,000 Fowlers from Haskell & Barker in 1914. These were thoroughly modern boxcars featuring outside metal roofs and cast steel trucks, as opposed to contemporary Canadian Fowlers that were still being built with all-wood or inside metal roofs and archbar trucks.

The Nickel Plate took control of the TStL&W in 1924, and all of the cars were repainted by 1930.

Oddballs on the Nickel Plate, which preferred double sheathed boxcars, they survived for almost three decades. There were still 976 of these cars on the roster in 1930, but between 1931 and 1933 the road scrapped nearly half of their freight car fleet, and these cars were among the first to go. 15 of them survived through the end of WWII but were quickly converted to doorless & roofless coke cars for use around Toledo. The last as-built boxcars were dropped from the roster in 1948, and the last of the coke cars were scrapped in 1952. A couple made it to the N&W takeover of 1964 in MOW use.

Nashville, Chattanooga & St. Louis

15100-16099, unknown builder 1913, 1,000 cars. 967 cars in 1930, 132 in 1950, gone by 1955.
16100-16599, ACF 1923, 500 cars. 500 cars in 1930, 445 in 1950, 31 in 1955, gone by 1959.

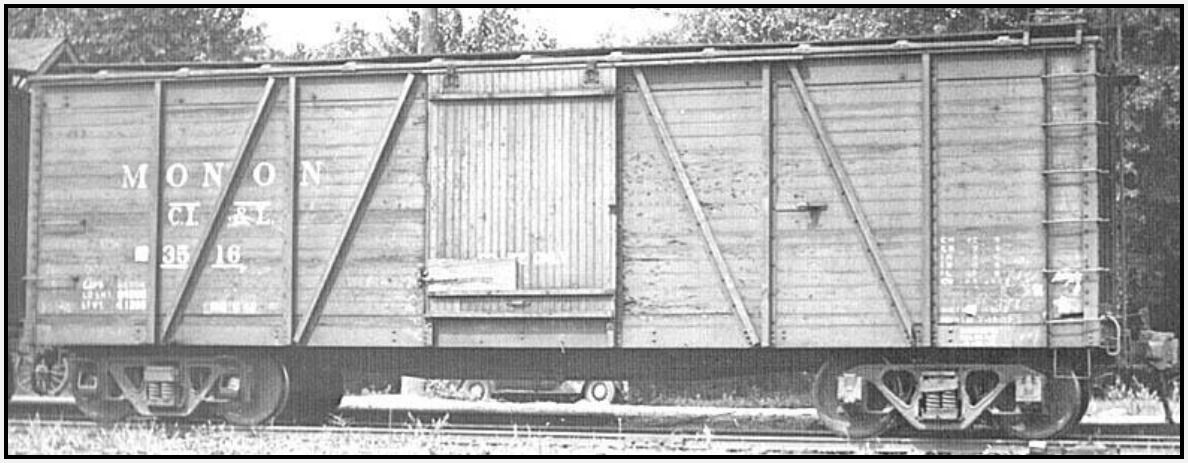
The NC&StL purchased 1,500 Fowlers in two groups ten years apart, and besides the doors the cars seem to have been built to nearly the same plans, and aside from a wide variety of paint schemes the cars were never materially changed through their lives. Starting after WWII the numbers of this group of cars decreased rapidly, with cars either being scrapped or converted into all-steel boxcars, a rarity for a 36-footer. The cars were all long gone by the time the L&N bought the road in 1959.

Chicago, Indianapolis & Louisville

2000-3699, Pullman 1913, 1,700 cars. 1,016 cars in 1930, 589 in 1945, gone by 1950.

As-built Monon Fowler. Pullman builder's photo.

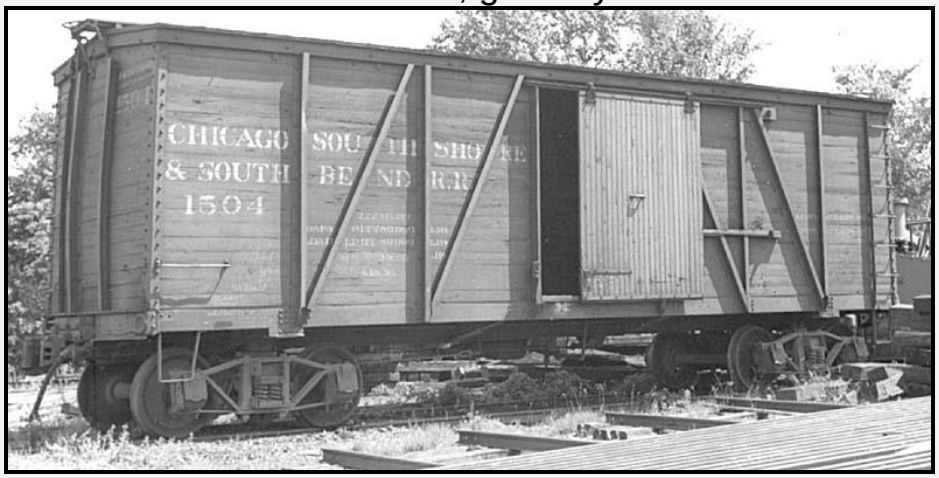
The Monon bought into the single sheathed boxcar idea early on, and bought 1,700 Fowlers in 1913. But it seems as though the road's master mechanic didn't quite trust the design, which is why they ended up being the only short Fowlers to sport fishbelly underframes. The cars were built with outside metal roofs and husky Andrews trucks, and seem to have been indestructible: although the cars were off the revenue roster by 1950 many of them lasted into the 1970s in MOW service.



Late period Monon Fowler seen during WWII, showing the cars with reinforced doors and post-1927 lettering.

Chicago, South Shore & South Bend

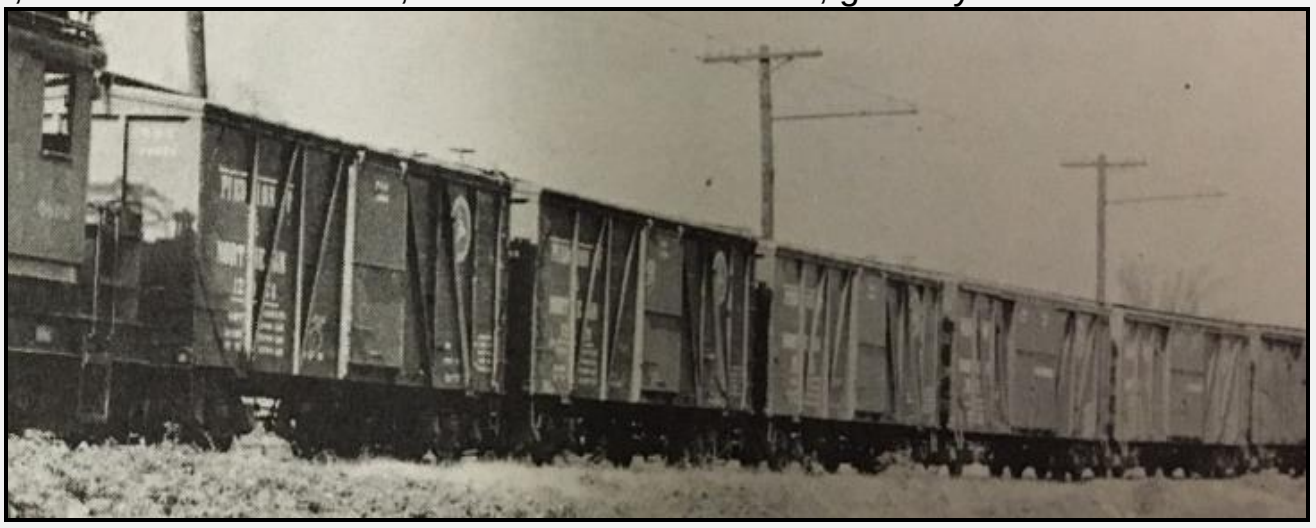
1501-1509, unknown builder or date. 7 cars in 1930, gone by 1945.



At one point the South Shore saw a need for a few boxcars and picked up ten Fowlers, likely built by neighboring Pullman. The above photo is dated to 1940. The group didn't survive to the end of WWII.

Piedmont & Northern

12000-12074, unknown builder 1914, 75 cars. 71 cars in 1930, gone by 1945.



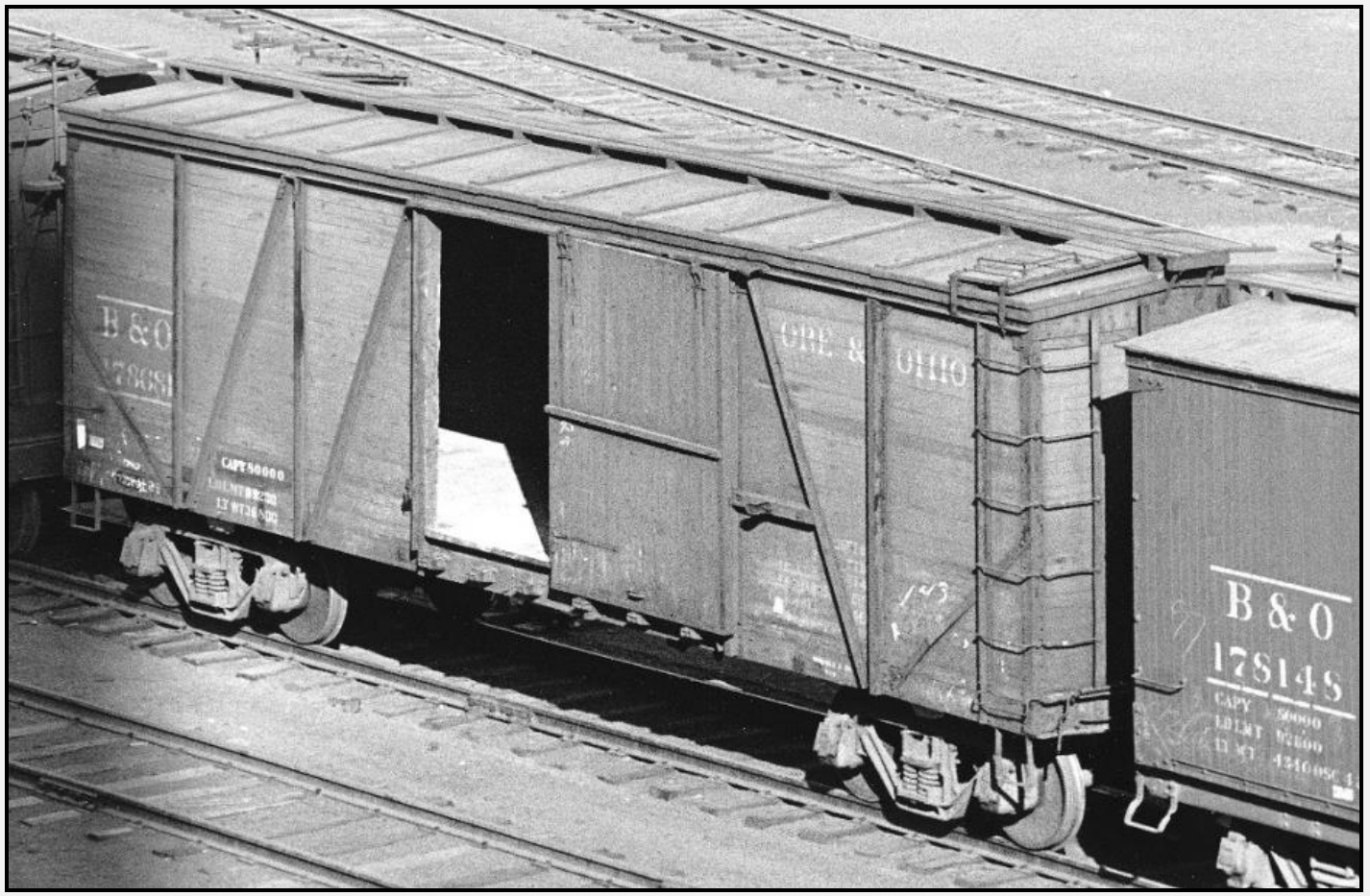
The Piedmont & Northern was a small interurban railroad in North Carolina, created by Duke Power in 1914 by buying several smaller lines and connecting them with new track. Based on the above photo the cars seem to be typical "American" type Fowlers with six foot doors and steel roofs, but only have two brace ends.

Cincinnati, Indianapolis & Western

18301-18650, H&B 1915 through 1917, 350 cars (to B&O in 1927).

Baltimore & Ohio

178500-178841. 341 cars in 1930, 1 car in 1945 (#178542), gone before 1950.

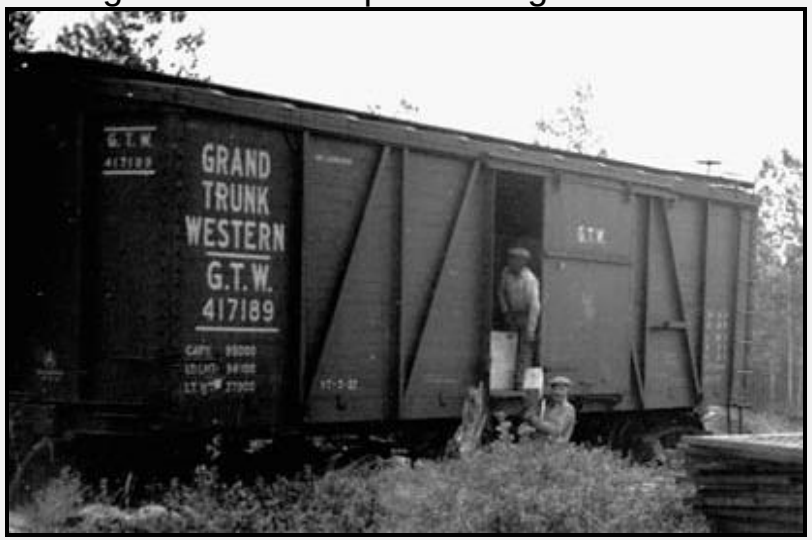


The CI&W bought 350 Fowlers from Haskell & Barker when the road reorganized in 1915. The cars seem to be identical to the Clover Leaf cars built by H&B a year earlier. The B&O bought the CI&W in 1927, and the cars were quickly repainted and incorporated into the B&O's roster. Although the car group was nearly intact at the beginning of the Depression, the series didn't survive to the end of WWII.

Grand Trunk Western

417150-420149 series cars, formerly GT 10000-102999, 3000 cars. 2,640 cars in 1930, 286 in 1950, 18 cars in 1955, gone by 1959.

440300-440627, reassigned from general CN car pool during WWII. 139 cars at peak, gone by 1960.



When the US lines of the former Grand Trunk Railway were reformed by the CN as the Grand Trunk Western in 1928, the CN gave the new road an assortment of used equipment including some of the GT's 6-foot door Fowlers. The GTW received a few more from the CN during WWII, apparently more ex-GT cars. The cars were scrapped as they came up for major repairs, and the last ones finally fell off the roster in 1959.

Interestingly, the GTW rebuilt most of their Fowlers with Hutchins ends soon after 1928 (the ends ceased production in 1930). Many of these cars survived in MOW service for the GTW and other roads into the 1980s.

SECONDHAND OWNERS

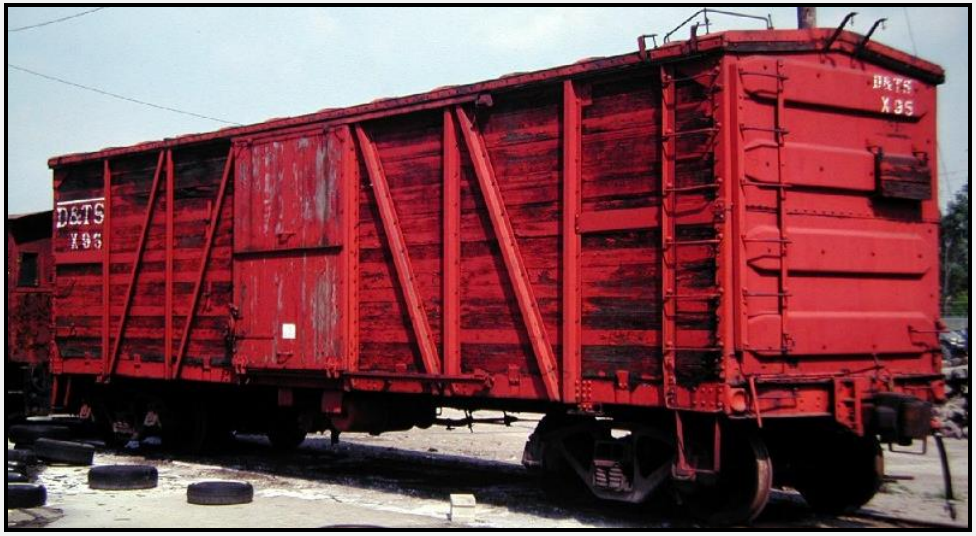
A.A. Merrilees & Co. (AAMX)

Andrew A. Merilees, Ltd. was a used railroad equipment reseller in Toronto, and at one time had a small collection of ex-TH&B Fowlers that they leased in the late 1950s and 1960s. AAMX doesn't show up in any ORER that I have in my collection, but from photos it appears that there were at least 50 cars in this leasing pool.

British Columbia Electric

The BCE never owned any revenue service boxcars, but it did have a few Fowlers bought secondhand for MOW service. This car appears to have been re-sheathed either in steel or plywood, and has a very unusual door.

Detroit & Toledo Shore Line

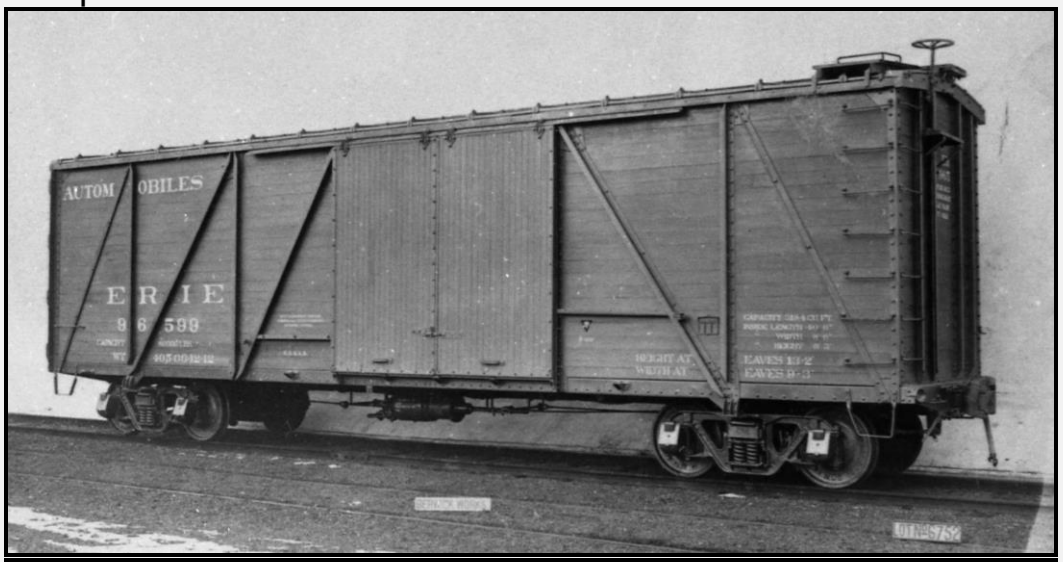


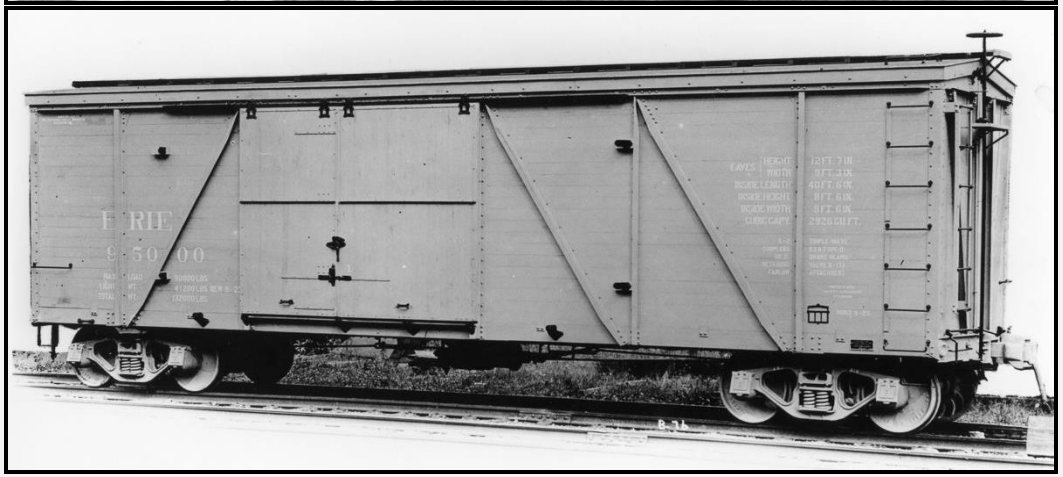
At some point in the 1950s the D&TSL bought a dozen short Fowlers from the GTW, using them in MOW service. Surprisingly, at least three of these cars survive in museums.

40-FOOT FOWLERS

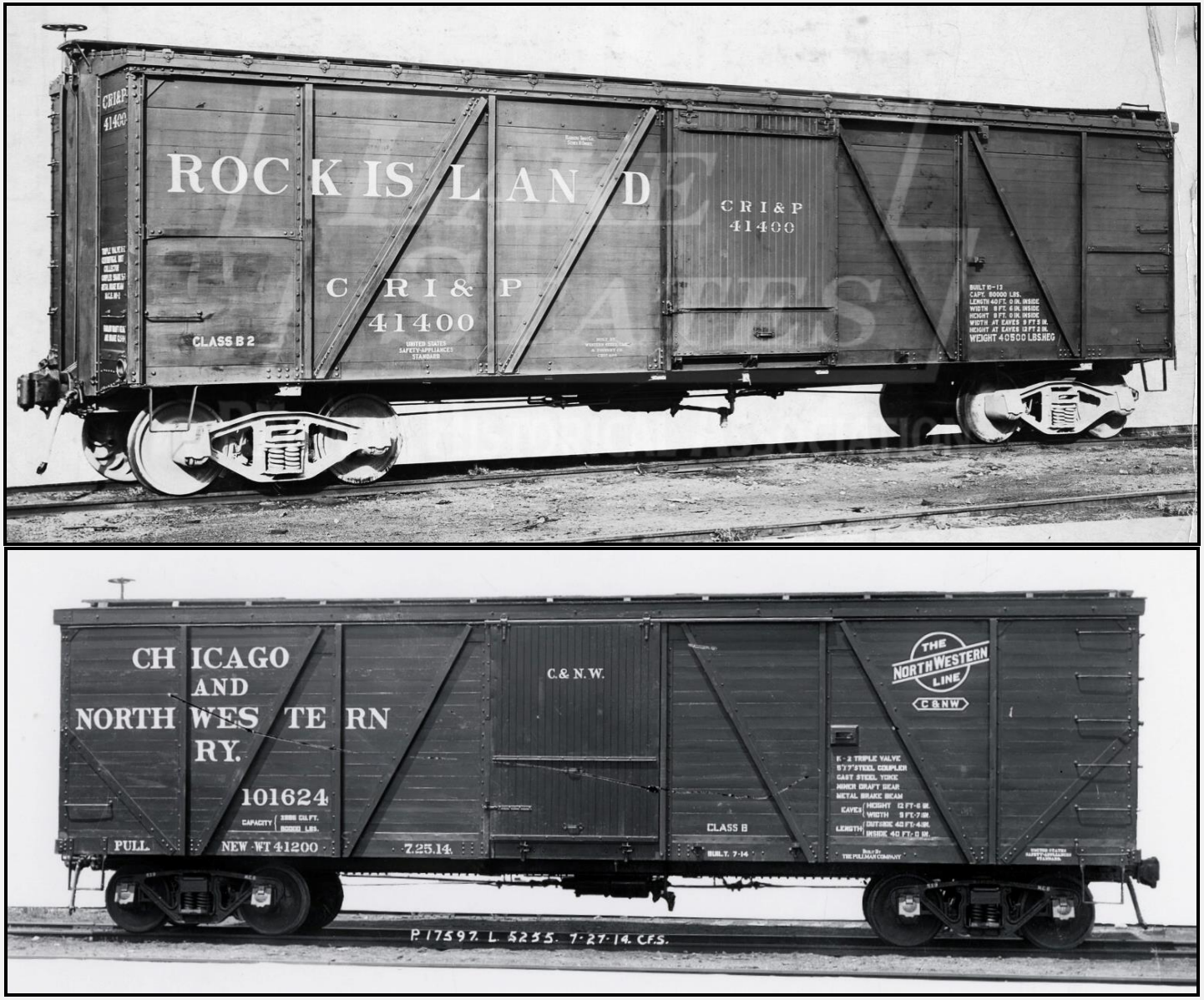
While the 26-foot American Fowlers were being built, half a dozen railroads experimented with stretching the cars into 40-footers. These “long Fowlers” were mostly popular with midwestern roads that hauled lots of bulk grain. The exception to this were the Erie’s 600 auto boxcars.

The Erie was the first to experiment with 40-foot Fowlers, building 600 cars in 1911. They liked the cars enough to build another 500 similar examples in 1925.



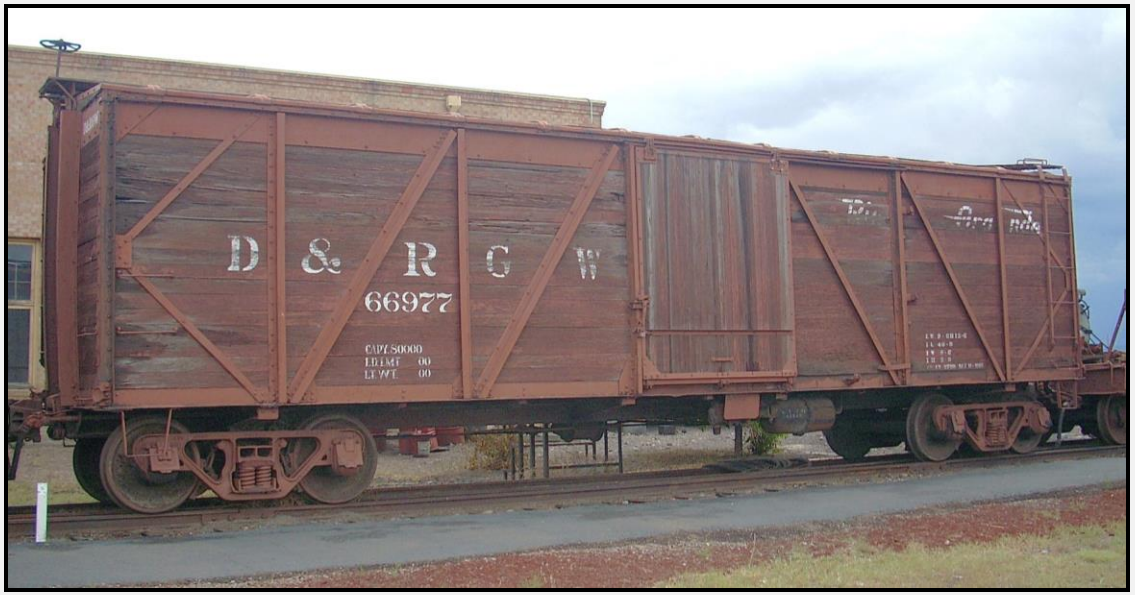


The Rock Island and C&NW both built thousands of 40-foot Fowlers between 1913 and 1915.

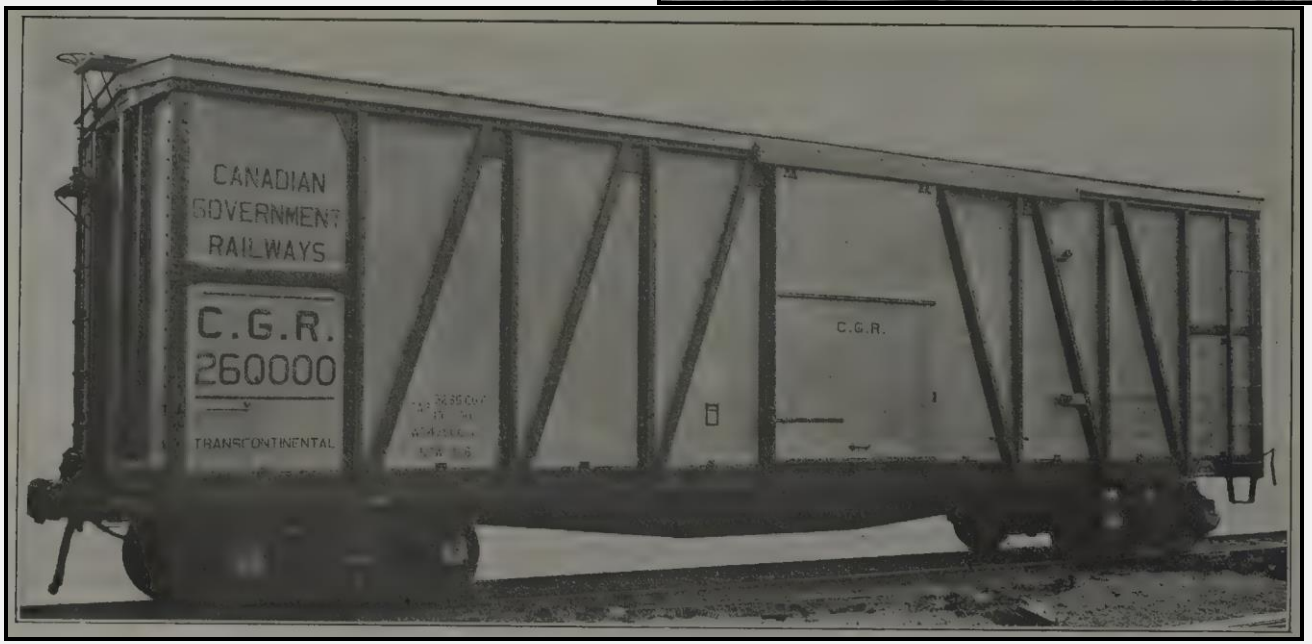


Some in the modeling community call some of these cars “clones”, although it’s unclear why, unless patents are considered. Small changes to a car design, including underframes, can create an entirely “new” car design.

The IC also bought 1,000 long Fowlers in 1914.



The Rio Grande bought 1,500 copies of the Rock Island cars in 1916.

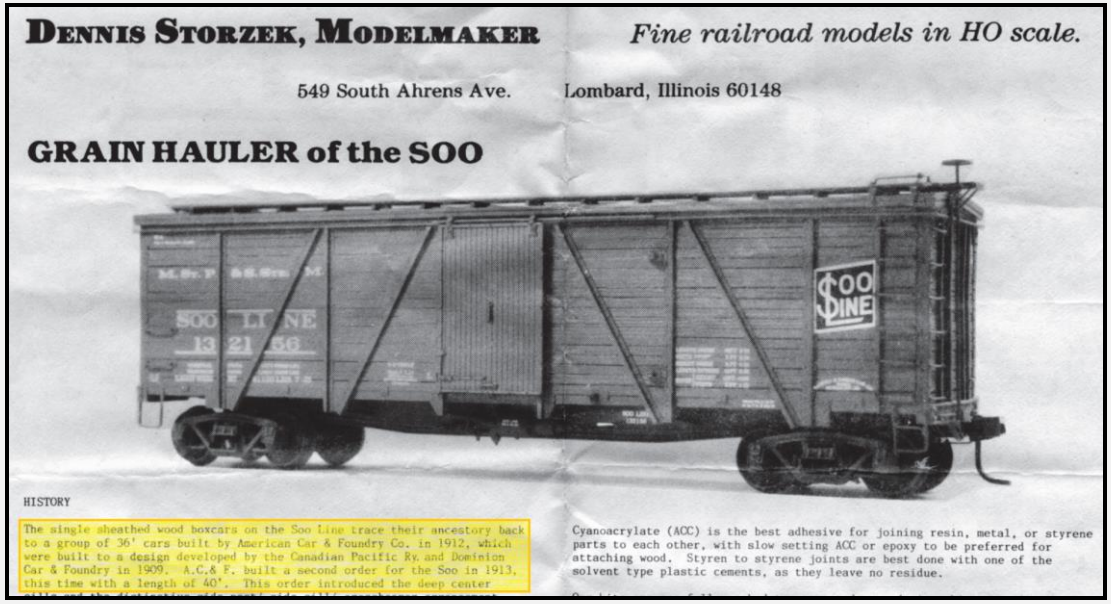


Also in 1916, the Canadian Government Railway built 1,000 cars in two batches; with fishbelly or straight center sill underframes.

THE SAWTOOTH CARS – FOWLERS?

Some modelers have called the unique “sawtooth” boxcars “Fowlers”. I can’t find any evidence that these cars have any direct connection to Fowler or his designs, aside from being early single sheathed boxcars.

The only connection between the two seems to be the instructions for one of the first resin freight car models, Dennis Storzek’s Soo sawtooth. Even here, he only suggests that the sawtooth cars were influenced by the Soo’s Fowlers, not directly connected.



So I think that it’s safe to say that the sawtooth cars were NOT Fowlers, and may have instead been an ACF design.

AFTERWORD

This clinic couldn't have happened without the help of several individuals and resources. I'd especially like to thank Al Westerfield, Dennis Storzek, Paul Clegg and Stafford Swain for their excellent research work and articles on the Fowler/Dominion boxcar type, which they did in the early 1980s before anything was digitized and easily complied.

Westerfield Model History Sheets #4301, 4302, 4305 and 4202.
Mainline Modeler Magazine, 6/1985, 7/1985, 11/1985, 1/1986 and 4/1986
Assorted Official Railway Equipment Registers, 1910 through 1979
Car Builder's Dictionary, 1913 edition
Assorted US Patents filed by William E. Fowler, 1908 through 1917
Railway Master Mechanic Magazine, 6/1913
John W. Barriger III National Railroad Library, ACF Builder's Photo Collection
Al Westerfield ACF Builder's Photo Collection
Fallen Flags ACF Builder's Photo Collection
Manitoba Agricultural Museum, CPR Boxcar

I'd like to also thank the "Pre-Depression Modeling Pirate Crew" for their continued support (prodding?) for my own research efforts, and Eric Hansmann for providing us with his great website as a place to discuss all things early rail modeling.

CN 9460 rolls through Bay View, Ontario in July 1980. The sixth car back, just before the MOW cars, is a 1914-built CP Fowler.