

UNITED STATES PATENT AND TRADEMARK OFFICE
BEFORE THE PATENT TRIAL AND APPEAL BOARD

FREIGHTCAR AMERICA, INC.,

Petitioner,

v.

NATIONAL STEEL CAR LIMITED,

Patent Owner

Case IPR2025-01046

Patent No. 8,166,892

PATENT OWNER'S RESPONSE

On behalf of National Steel Car Limited

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EXHIBIT LIST	
2001	Declaration of Dr. Mark J. Viz, Ph.D., P.E., signed August 18, 2025 in support of Patent Owner's Request for Discretionary Denial of Institution
2002	Scheduling Order, D.I. 38, No. 24-cv-00594-JLH-CJB (D. Del.)
2003	Docket Sheet, No. 24-cv-00594-JLH-CJB (D. Del.)
2004	Plaintiff's Second Amended Complaint, D.I. 56, No. 24-cv-00594-JLH-CJB (D. Del.)
2005	Report and Recommendations Denying FreightCar's Motion to Dismiss, D.I. 45, No. 24-cv-00594-JLH-CJB (D. Del.)
2006	Order Adopting Report and Recommendation Denying Motion to Dismiss, D.I. 49, No. 24-cv-00594-JLH-CJB (D. Del.)
2007	FILED UNDER SEAL - Answer to Second Amended Complaint, D.I. 68, No. 24-cv-00594-JLH-CJB (D. Del.)
2008	Petitioner's Invalidity Contentions from No. 24-cv-00594-JLH-CJB (D. Del.)
2009	Petitioner's <i>Sotera</i> Stipulation
2010	Portions of United States District Courts—National Judicial Caseload Profile for 12-month period ending March 31, 2025; available at https://www.uscourts.gov/data-news/reports/statistical-reports/federal-court-management-statistics
2011	Time to Milestones for the District of Delaware, DocketNavigator
2012	U.S. Provisional Application No. 61/977,753
2013	WIPO Publication No. WO2015/157734
2014	U.S. Patent No. 10,017,191
2015	Inventor's Declaration from file history of U.S. Patent No. 10,017,191
2016	Information Disclosure Statement Dated December 20, 2016 from File History for the Application that Issued as U.S. Patent No. 10,017,191
2017	U.S. Patent No. 10,710,612
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2022	U.S. Patent Publication No. 2021/0009,169 (U.S. App. No. 17/038,205)

2023	Inventor's Declaration from file history of U.S. App. No. 17/038,205
2024	Complaint for Patent Infringement in <i>National Steel Car Ltd. v. FreightCar America, Inc.</i> , No. 11-cv-08743 (N.D. Ill.).
2025	Complaint for Patent Infringement in <i>National Steel Car Ltd. v. FreightCar America, Inc.</i> , No. 15-cv-03418 (N.D. Ill.).
2026	Complaint for Patent Infringement in <i>National Steel Car Ltd. v. FreightCar America, Inc.</i> , No. 15-cv-08643 (N.D. Ill.).
2027	FILED UNDER SEAL - 2017 Settlement Agreement between National Steel Car Limited and FreightCar America, Inc.
2028	FILED UNDER SEAL - Email Between National Steel Car Limited Employees
2029	Statistics for Judge Hall in Patent Cases Since January 1, 2021, DocketNavigator
2030	Tarmac PGA Stone Wagons
2031	Agreed Protective Order Regarding the Disclosure and Use of Discovery Material, D.I. 42, No. 24-cv-00594-JLH-CJB (D. Del.)
2032	Company, FreightCar America Webpage, available at https://freightcaramerica.com/company/
2033	FILED UNDER SEAL - FreightCar America's Response to Interrogatory No. 7
2034	U.S. Patent No. 8,132,515
2035	Declaration of Mark J. Viz Ph.D., P.E. Under 37 C.F.R. § 1.68
2036	Article, "This Company Got a \$10 Million PPP Loan, Then Closed Its Plant and Moved Manufacturing Jobs to Mexico", available at https://www.propublica.org/article/this-company-got-a-10-millionppp-loan-then-closed-its-plant-and-moved-manufacturing-jobs-tomexico
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2038	FILED UNDER SEAL - NSC024815
2039	FILED UNDER SEAL - NSC021773
2040	FILED UNDER SEAL - NSC037310
2041	FILED UNDER SEAL - NSC028291
2042	FCA0000280 Original
2043	FCA0000280 Reproduced
2044	Email from Counsel Robert Keeler to Justin Gillett
2045	Declaration of Laura Jewell
2046	Terminal Disclaimer of Claim 1 of U.S. Patent No. 8,166,892
2047	RESERVED

2048	FILED UNDER SEAL - NSC011814
2049	RESERVED
2050	RESERVED
2051	RESERVED
2052	Claim Construction Order, filed December 17, 2025, Document 177, 1:24-cv-00594-JLH-CJB
2053	Claim Construction Reports and Recommendations, November 21, 2025, Document 170-172, 1:24-cv-00594-JLH-CJB
2054	Amended Joint Claim Construction Chart, filed November 10, 2025, Document 163, 1:24-cv-00594-JLH-CJB
2055	<i>Manual of Standards and recommended practices. section C, part II. Design, Fabrication, and Construction of Freight Cars.</i> (2023). Association of American Railroads.
2056	Deposition transcript of Sylvia Hall-Ellis, Ph.D., taken February 27, 2026, and exhibits
2057	Deposition transcript of Medhi Ahmadian, Ph.D., taken March 5, 2026, and exhibits
2058	Declaration of Mark J. Viz, Ph.D., P.E. signed March 13, 2026 in support of Patent Owner Response

I. INTRODUCTION

Following FreightCar America, Inc.'s ("Petitioner") copying of National Steel Car Limited's ("PO") proprietary railroad hopper car design, PO sued Petitioner for, inter alia, infringement of U.S. Patent No. 8,166,892 (EX1001, "the '892 Patent"). Petitioner now seeks a duplicative and inefficient *inter partes* review of claims 2-15 (the "challenged claims").

Petitioner's challenge suffers from foundational defects. Most critically, Petitioner fails to address or substantively analyze multiple limitations that the Board identified as pivotal. Petitioner does not present the claim-by-claim, limitation-by-limitation analysis required to establish unpatentability, or a coherent analysis of any claim as a whole, rendering the Petition legally insufficient. 35 U.S.C. §312(a)(3); 37 C.F.R. §42.104(b)(4); *Harmonic Inc. v. Avid Technology, Inc.*, 815 F.3d 1356 (Fed. Cir. 2016).

The Petition also offers no credible motivation—rooted in the teachings of the prior art, supported by evidentiary reasoning, or grounded in the perspective of a person of ordinary skill in the art at the relevant time ("POSITA")—to combine the cited references in any manner that would yield the claimed inventions. Instead, Petitioner relies on retrospective reasoning and unsubstantiated assertions that fail to demonstrate why a POSITA would have undertaken the proposed combinations,

or why the combinations would have been expected to succeed. Absent a *KSR*-compliant rationale, Petitioner's obviousness grounds collapse.

The Board instituted review on Grounds 1b-1d and 2b-2c but the cited references do not render obvious the challenged claims and Petitioner has not carried its burden to demonstrate unpatentability by a preponderance of the evidence. Objective indicia of non-obviousness further reinforce the patentability of the claimed inventions. Claims 2-15 of the '892 Patent remain patentable.

II. FACTUAL BACKGROUND

PO designed, built, and sold hundreds of open-top, bottom-discharge railcars (colloquially referred to as "jennies") to Canadian National Railway Company ("CN") for use on its Duluth, Missabe and Iron Range Railway ("DMIR") in 2009. Images of these jennies are shown below:



The '892 Patent identifies several design constraints stemming from the requirements of the DMIR, which rendered prior art designs unsuitable and led to the distinctive design of the PO's patented railcars. The design constraints include: (1) a large door opening; (2) a steep loading/unloading chute; (3) increased lading

volume within a constrained car length; (4) a low overall height relative to Top of Rail; (5) a low center of gravity; (6) minimization of car length over the trucks; and (7) operational requirements specific to unit-train service. '892 Patent, 1:41-2:13.

In 2024, Petitioner announced that it sold 600 new 1,150 cubic-foot iron-ore hopper cars, built in Mexico, for the DMIR. EX2004 ¶39. Images of these cars are below:





EX2004 ¶50. These cars adopt the design features claimed in the '892 Patent that distinguish PO's DMIR jennies, confirming the technological significance of the patented configurations. In response, PO sued Petitioner in the District of Delaware for infringing the '892 Patent. EX2003.

III. PROCEDURAL POSTURE AND ISSUES PRESERVED

After the Petition, PO disclaimed claim 1 of the '892 patent. The Board instituted review on claims 2-15, and not on Grounds 1a and 2a. Institution Decision, 2.

A. EX1054 Should be Excluded

Over PO's objection, Petitioner was granted leave to "correct" EX1004 by filing a higher-resolution copy as EX1054. The Board stated that all citations to

EX1004 will be treated as also citing EX1054 and that PO's evidentiary concerns may be raised "during trial." Institution Decision, 14-15. Consistent with that guidance, PO will separately move to exclude Ex. 1054.

Even if not excluded, EX1054 should carry little weight. Substituting a clearer copy at institution cannot retroactively supply new micro-features, annotations, or rationales never articulated in the Petition. Accordingly, little weight should be given to any attempt to use Ex. 1054 to expand any arguments not in the Petition.

B. Institution turned on preliminary views of three limitations in claim 2

In instituting review on claims 2-14, the Board preliminarily accepted the following showings by Petitioner and identified such as pivotal: (i) the 1946 Cyclopedia (or Wong in the alternative) discloses or renders obvious a "first cross-wise extending beam" at the upper end of the end slope sheet ([2i]); (ii) it would have been obvious to implement Lindström's actuator above the shear plate and overhung by the slope sheet ([2l]); and (iii) "web continuity" in [2u] can be satisfied by vertical alignment/co-planarity of two stiffener portions. The Board emphasized these conclusions were preliminary and expressly contemplated further development of these disputes at trial. Institution Decision 19-34. PO addresses those three limitations herein and demonstrates that Petitioner has not carried its burden by a preponderance of the evidence.

IV. OVERVIEW OF THE '892 PATENT

Claim 1 of the '892 Patent was disclaimed. EX2046. Remaining independent claim 2 is reproduced below in part with emphasis added and with Petitioner's annotations "2a"- "2u" included:

1. [2a] A rail road hopper car comprising:

...

[2i] *said upper, longitudinally outboard end of said first end slope sheet being reinforced by a first cross-wise extending beam;*

...

[2l] *a door actuator mounted above said shear plate, said door actuator being at least partially overhung by said first end slope sheet; said door actuator being connected to said door by a mechanical transmission;*

...

[2u] *said sidewall stiffener having web continuity between said first and second portions thereof.*

Petition 2-5; '892 Patent 23:38-24:60.

V. OVERVIEW OF RELEVANT ENGINEERING PRINCIPLES

A POSITA would understand that one individual component of a railcar cannot be added or modified without consideration of the entire structure in satisfying these constraints, as a railcar's structure is a complex, interconnected system that is engineered for safety, efficacy, and efficiency. As PO's expert Dr. Viz

explains, visual depictions alone, especially aged schematics such as those in the 1946 Cyclopedia, are insufficient to understand the structural interrelationships of a railcar. EX2058, “Viz” ¶¶49-62. Railcar structure is designed to support loads of various types. Design decisions depend on the placement, orientation, geometric details (*e.g.*, thickness, shape of cross-section, *etc.*), connection, and integration of every structural component within the railcar. These components must be evaluated in combination to ensure proper load transfer down to the trucks, and ultimately the rails. Viz ¶¶49-62.

The Petitioner and Dr. Ahmadian, however, rely on impermissible hindsight by proposing modifications to legacy railcar designs shown in photographs and low-resolution/old-style schematics without articulating a POSITA-level basis, rooted in engineering, regulatory requirements, or prior-art teachings, for making such modifications. Viz ¶¶49-62.

VI. LEVEL OF ORDINARY SKILL IN THE ART

The Board preliminarily adopted Petitioner's definition that a POSITA “would have had at least a bachelor's degree in a discipline related to mechanical engineering, physics, structural design, or an equivalent discipline, and at least two years of experience designing or analyzing rail cars or similar vehicles.” Institution Decision 12. Petitioner's expansion of the field to include designers of “similar vehicles” improperly dilutes the relevant art and prejudices the merits phase.

The '892 Patent addresses rail-car-specific structural and regulatory constraints, including slope-sheet geometry, end-section load-paths, truck centers, top-chord interactions, and bottom-discharge arrangements, that individuals experienced primarily with industrial vehicles (e.g., trucks, mining equipment, or trailers) would not meaningfully appreciate. An overbroad POSITA artificially lowers the bar for obviousness, contravenes Federal Circuit precedent requiring that the POSITA reflect the actual knowledge base of the field addressed by the patent, and encourages hindsight by importing irrelevant engineering concepts lacking proper connection to that field.

The Board's reliance on Petitioner's declarant, despite evidence that he lacks industry experience with railcar structural design, further illustrates the risk of adopting an overbroad POSITA definition. PO's expert explained that Petitioner's declarant "conflates various concepts that a [POSITA] with practical industry experience and knowledge would not." A POSITA definition grounded in irrelevant experience invites analytical error in claim interpretation and obviousness.

Thus, the Board should reject Petitioner's overbroad POSITA definition and adopt the railcar-specific standard supported by the record and by common-sense application of the *Graham* factors.

VII. CLAIM CONSTRUCTION

The Institution Decision declined to construe the claims. However, the District Court has construed a key term in the '892 Patent, providing guidance the Board should not ignore. EX2052. Specifically, “sloped side sheet” was construed to mean “a sheet extending in a longitudinal direction with respect to a side of the hopper and which forms a sloped surface.” *Id.*

As the District Court recognized, the parties agreed that the claimed “transition portion” corresponds to what the patent describes as “intermediate portion 98” (also referred to in the patent as “sloped portion 98” or “sloping portion 98”)—and that intermediate portion 98 is undisputedly part of the claimed “sidewall.” EX2053 at 2. Because the “sloped side sheet” and “sidewall” are recited as two distinct structural elements meeting at an interface, they are presumed to be separate components—meaning the sloped sheet cannot itself be a component of the sidewall. EX2053 at 1-2.

Accordingly, the sloped side sheet is properly interpreted as depicted in the following annotated Figure 2c of the '892 Patent (annotated to add and show the side slope sheet in green, bottom flange 100 in blue, and sloped portion 98 in yellow):

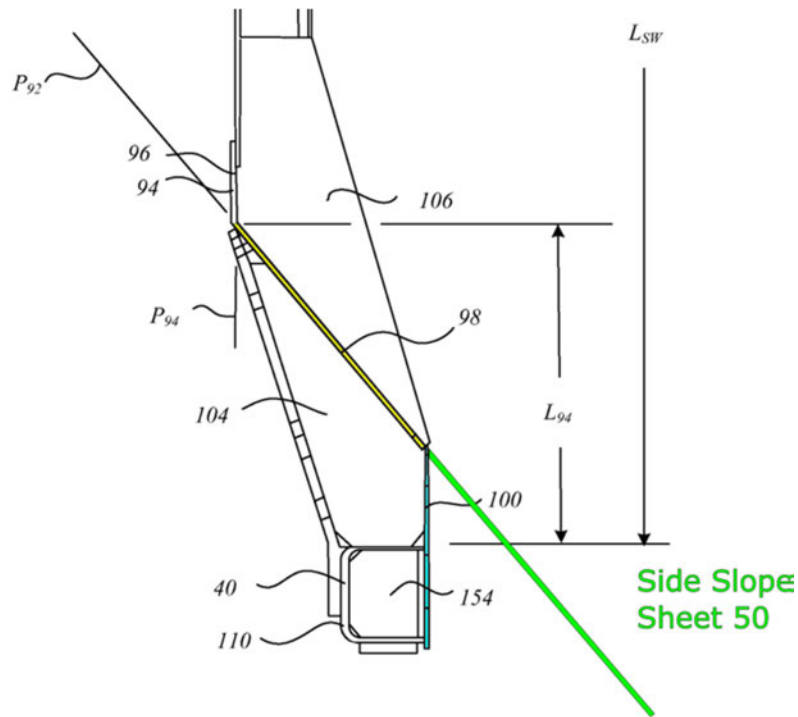


Figure 2c

The Petition adopted this construction in its discussion of claim limitations 6b and 7 in Ground 1b. Petition 68-71. However, Petitioner then advanced a different construction (one which was rejected by the District Court) in its discussion of claim limitation 6b and 7 in Ground 2b. Petition 118-121. These conflicting constructions fatally undermine Petitioner's challenges in Ground 2b.

No additional constructions of the challenged claims are required. *See Phillips v. AWH Corp.*, 415 F.3d 1303, 1312-13 (Fed. Cir. 2005); 37 C.F.R. §42.100(b).

VIII. THE PETITION FAILS TO ESTABLISH BY A PREPONDERANCE OF THE EVIDENCE THAT ANY CHALLENGED CLAIM IS UNPATENTABLE

The Board instituted review based on the preliminary view that Petitioner had a reasonable likelihood of prevailing regarding independent claim 2 under Ground 1b. Institution Decision 37. PO submits that none of the challenged claims are unpatentable, and the Petition fails to meet its burden.

A. Ground 1b

Petitioner asserts in Ground 1b that claims 2-8 and 10-14 would have been obvious over the 1946 Cyclopedia in view of Lindström and optionally, Wong. As demonstrated below, the Petition fails to prove unpatentability by a preponderance of the evidence.

i. Claim limitation [2i]

(1) *The Petition never proves that an end top chord is the claimed “first cross-wise extending beam”*

Claim limitation [2i] requires “said upper, longitudinally outboard end of said first end slope sheet being reinforced by a first cross-wise extending beam.” In other words, [2i] requires a reinforcement at the upper, longitudinal outboard end of the end slope sheet, not “any cross-wise member nearby.” Petitioner equates the 1946 Cyclopedias’ **end top chord** with the claimed “first cross-wise extending beam.”

But the claim's text and specification require a distinct reinforcement at the slope-sheet joint.

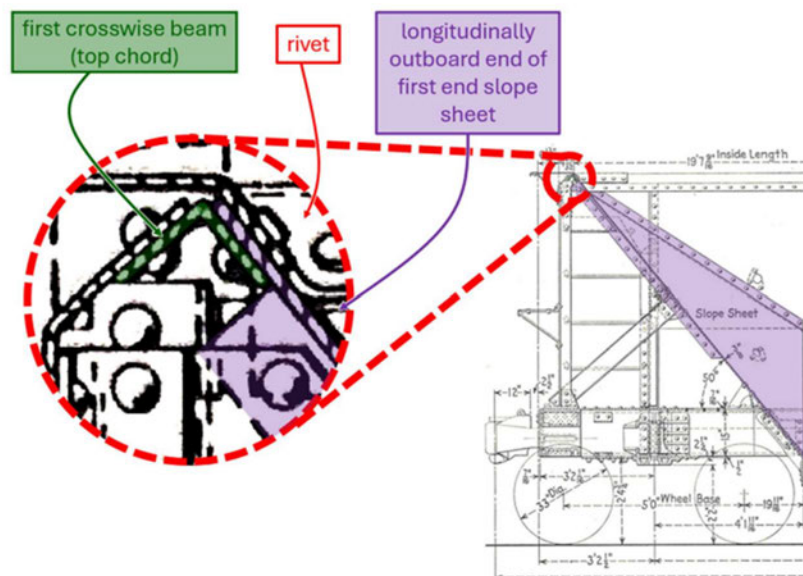
The '892 Patent itself differentiates the members: it discloses a closed-section "end slope sheet reinforcement beam 140" at the slope-sheet interface, which is separate from top chord 86, and explains how the closed section is formed and welded to the sheet. That is the [2i] beam. '892 Patent, 16:29-48; Fig. 3a. Petitioner never shows the top chord functioning as that reinforcement at the claimed locus (as opposed to capping the end wall generally). Labeling the chord "a beam" is not proof of the claimed reinforcement. Institution Decision 6-10, 19-23; Petition 50-51.

The Board's statement that the claimed "end top chord" is not commensurate in scope with claim 2, which does not recite an "end top chord," Institution Decision 22, misses the point. Claim differentiation forecloses reading "end top chord" into [2i]. Dependent claim 8 adds an "end top chord," which presumes the independent claim lacks that feature absent contrary intrinsic evidence. Thus, [2i]'s "first cross-wise beam" is not the end top chord. The Board's observation that claim 2 does not recite an "end top chord" does not permit construing [2i] as if it did. Institution Decision 22-23.

Indeed, the "end top chord" and the "first cross-wise extending beam" are different structures with different functions. The intrinsic record draws the line: the patent's figures and text separate the top chord from the laterally extending

reinforcement built at the slope-sheet interface. Petitioner, not PO, bears the burden to overcome that textual structure; it has not. *See* '892 Patent 16:29-57; Fig. 3a; Institution Decision 23.

As Dr. Viz explained, a POSITA would not have understood the 1946 Cyclopedia to teach a “first cross-wise extending beam.” Viz ¶¶64-65. The Petition admits the 1946 Cyclopedia teaches only that there may be “a crosswise beam with a V-shaped cross-section,” which it annotates as a “top chord,” and contends provides the claimed “end top chord” in claim 8:



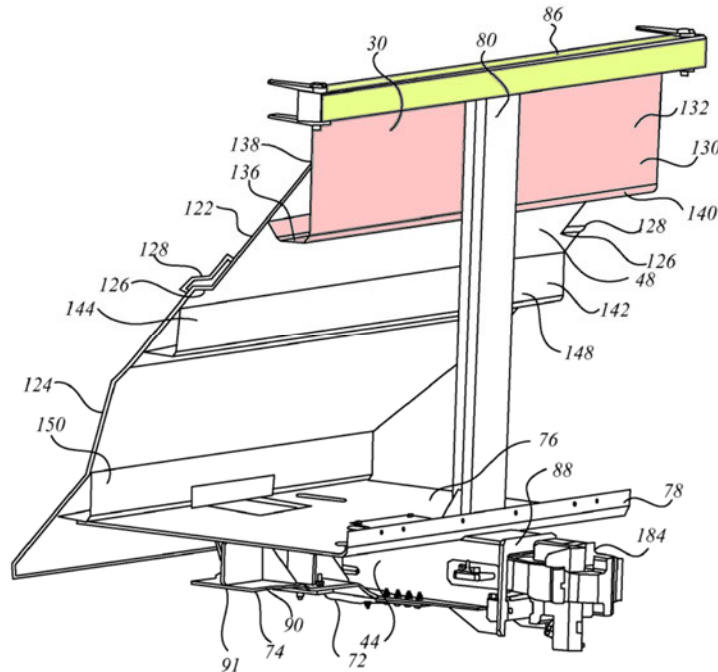
See Petition 50-51. This crosswise beam with a V-shaped cross section does not primarily serve to reinforce the first end slope sheet, but is a stiffening member to the overall structure of the railcar.

Here, Petitioner’s §103 theory collapses unless the “first cross-wise extending beam” in the independent claim can be equated with the “end top chord” in

dependent claim 8. Claim differentiation presumes that is not the case, and is rebuttable only by contrary intrinsic evidence. *See e.g., Littelfuse, Inc. v. Mersen USA EP Corp.*, 29 F.4th 1376, 1380 (Fed. Cir. 2022) (vacating a construction that made a broader independent claim coextensive with a narrower dependent set).

The '892 Patent's end-structure disclosure distinguishes a top chord from a slope-end reinforcement, and shows a laterally extending, closed-section reinforcement built at the interface with the end slope sheet (*see* Fig. 3a discussion), underscoring that Petitioner must prove the claimed reinforcement at the slope end, not simply that some cross-wise member exists in the vicinity. Petitioner never did that. Institution Decision 6-8 (overview of end-wall/beam features).

The claimed "first cross-wise extending beam" is described in the specification for the '892 Patent as "laterally extending end slope sheet reinforcement beam 140", in contrast to the top chord 86. '892 Patent 16:29-48 (emphasis added); 16:49-57 (describing other cross-wise beams.).



'892 Patent at Fig. 3a (annotated to show top chord 86 in green and the structure that comprises the “first crosswise beam” in red.)

The Board states that PO does not identify any specific difference in the purposes associated with the two terms, “end top chord” and “first crosswise beam.” Institution Decision 23. The doctrine of claim differentiation does not require PO to prove different purposes; it rests on the textual structure of the claims. Top chords and the claimed cross-wise beams perform different functions. *Viz* ¶66. The claimed first cross-wise beam primarily functions to provide reinforcement for the slope sheet. *Viz* ¶69. A top chord is primarily and fundamentally a critical stiffening member of the box beam structure formed overall by the entire hopper structure of the railcar. Thus, a POSITA would not conflate the claimed cross-wise beam with

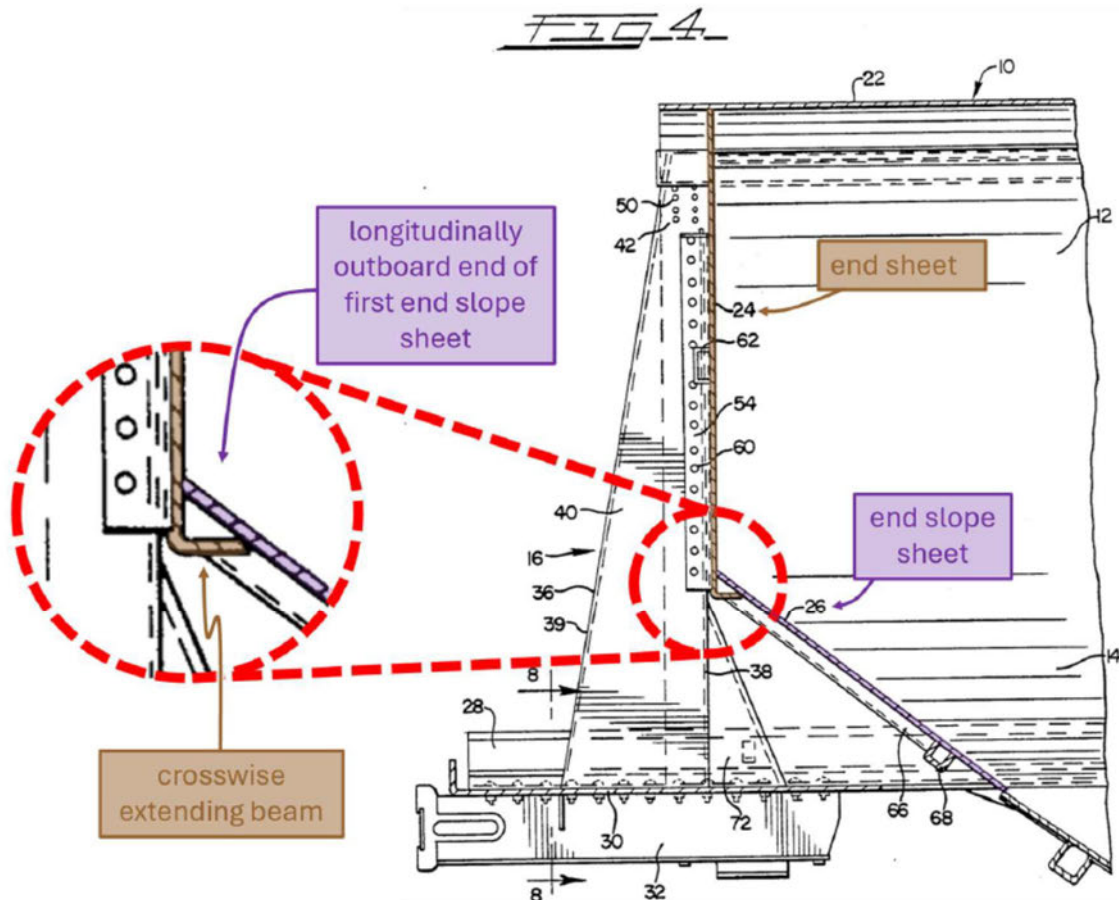
the claimed top chord. Viz ¶¶65-66. And the 1946 Cyclopedias' V-shaped crosswise beam is therefore not the claimed cross-wise extending beam.

(2) Petitioner's Wong fallback is functionally a materials-mismatch and lacks a workable installation

Wong's L-detail is an L-shaped edge portion of an end sheet for a tanker car, not a transplantable reinforcement for a 1940s steel ore car. Petitioner supplies no fastening path, clearance analysis, or load-transfer mechanics for inserting Wong's L-shaped detail into the 1946 Cyclopedia/Lindström envelopes; its figures are label overlays, not engineering. Institution Decision 23-26; Petition 52-53. The record confirms the mismatch: Wong addresses mixed-materials interfaces; even Petitioner's declarant acknowledged steel/aluminum differences and welding limits, and distinguished tanker vs. hopper ore car design loads and service environments. Those admissions eliminate any commonsense reason a POSITA would borrow Wong to reinforce a steel slope sheet.

Wong's L-shaped detail is nothing like the claimed "first cross-wise extending beam" in the '892 Patent. Rather, as seen in the annotated Fig. 4 of Wong reproduced below, it is the joint where the aluminum end slope sheet 26 is connected to the vertical aluminum end sheet 24.

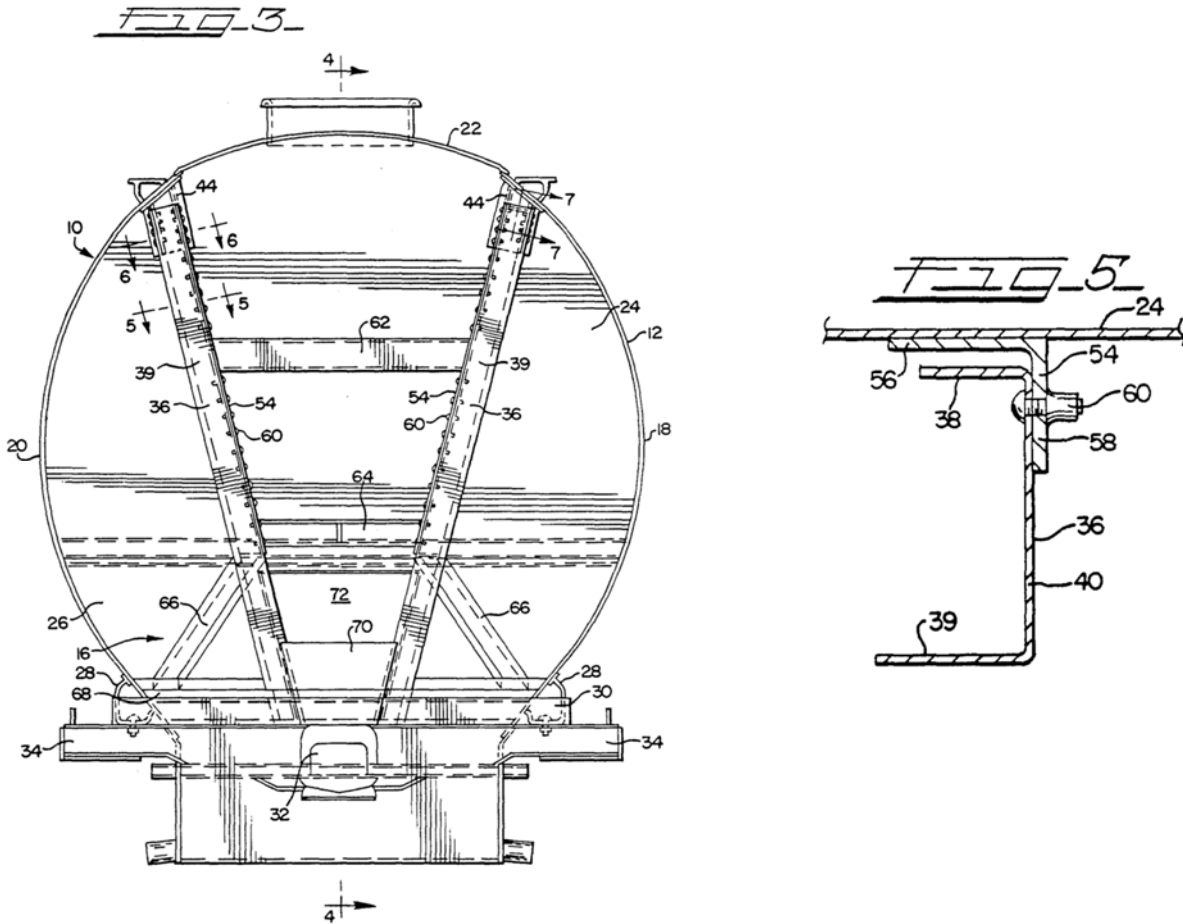
Wong does not use the L-shaped detail as a reinforcement. Viz ¶¶69-74. Instead, Wong uses a plurality of aluminum channel stiffener members 66 welded to the slope sheet 26 to provide reinforcement. EX1006 4:50-56.



Wong's aluminum end sheet 24 with L-shaped detail addresses material coupling/attachment in an aluminum/steel configuration and shows a particular joint geometry, not a generic, transplantable "reinforcement beam" for a 1940s ore-car end frame. Petitioner never reconciled materials, fastener/attachment paths, interference with existing 1946 Cyclopedia members, or load-transfer consequences (e.g., whether the added shape would collide with end-frame components, alter door

clearances, or re-route load paths already handled by struts/brackets the 1946 Cyclopedia discloses); nor did Petitioner address the material differences between hopper ore car design like those in the 1946 Cyclopedia and tanker cars like that of Wong. The Institution Decision credited “same field” and “benefit in reinforcing,” but did not identify a workable installation in the 1946 Cyclopedia envelope, only a label overlay; nor did it identify the material differences between forces and moments experienced by hopper ore cars compared to tanker cars. Institution Decision 23-26.

For example, referring to FIGS. 3 and 7 in Wong (reproduced below), the end sheet 24 is a semicircular, aluminum sheet that is supported by a height-wise angle member 54 welded thereto, which in turn is bolted to a web portion 40. EX1006 4:24-37; Viz. ¶¶69-75. While the L-shaped detail at bottom of the end sheet 24 appears to be in contact with the end slope sheet 26, a POSITA would have understood it does not provide reinforcement to the end slope sheet 26; that is done by the aluminum channel stiffener members 66 that are welded to the end slope sheet 26. EX1006 4:50-57; Viz. ¶¶69-75.



Wong's core teaching is materials-specific - that is, a "steel end structure for [an] aluminum railcar" that manages steel vs. aluminum load paths and weight. Dr. Ahmadian agreed that Wong is about using steel to bear significant loads and aluminum to reduce weight. EX2057 174:4-175:9. He also admitted steel and aluminum have materially different stiffness/strength characteristics and that welding steel to aluminum "is not a good practice." *Id.*, 175:17-19; 73:18-22. That is not the design space of a monolithic steel ore car. *Viz.* ¶¶74-80. Using an aluminum-driven joint geometry to prove obviousness for a steel-only ore car invites impermissible hindsight.

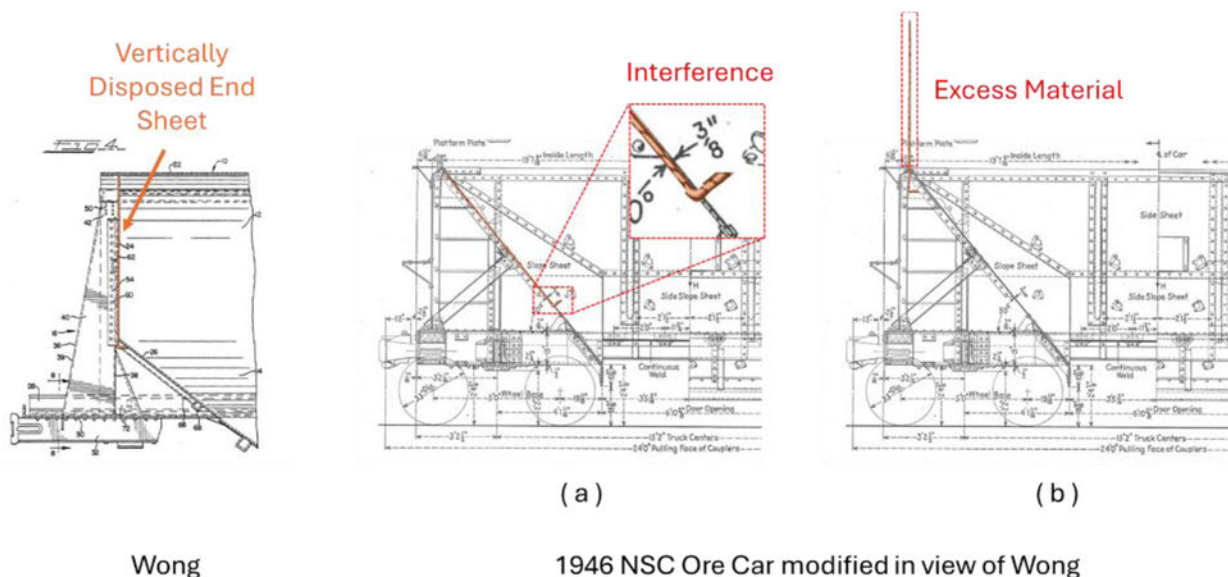
These concessions underscore how Wong's mixed-material interface problems (and solutions) are irrelevant to a steel ore car. Further, Dr. Ahmadian explained that different commodities drive different design considerations; a car for crude oil is "designed one way," while a car for bulk aggregate (coal/ore) is "designed another way." EX2057 20:8-20:21. A POSITA focused on steel hopper cars, which are expected to endure heavy, abrasive loads, would not look to an aluminum/steel tanker interface for reinforcement concepts.

Dr. Ahmadian also acknowledged dynamic impact loads: when ore is dumped from height into an open-top hopper, dynamic forces increase and must be accounted for in design, which is a different load case than filling a sealed tanker with, for example, fluid. EX2057 37:15-39:2, 20:8-26:13. That difference goes straight to local reinforcement strategy at the slope sheet and end structure: an aluminum/steel tanker end sheet detail is not engineered for granular impact/abrasion of ore and the associated bending/shear paths in a hopper. Viz. ¶¶74-80.

Wong's end-structure detail, which is optimized for material coupling and puncture/weight concerns of a tanker, offers no reasoned path to address the granular impact/abrasion and door-geometry realities of a hopper ore car. Dr. Ahmadian's own testimony that commodity and loading method change the engineering confirms a POSITA would not reflexively borrow tanker solutions for a hopper reinforcement.

The Petition fails to articulate a reason why a POSITA would have been motivated to combine the 1946 Cyclopedia and Wong, or that the proposed combination would have been successful. *Viz* ¶¶74-79. Indeed, the 1946 Cyclopedia is, at minimum, satisfactory for its intended purposes and Petitioner's proposed modification is an unworkable solution to a problem that does not exist, one that is motivated, at best, by application of improper hindsight.

The Petition also fails to articulate *how* the end sheet 24 with L-shaped detail of Wong would be incorporated into the 1946 Cyclopedia. A POSITA would not find structural, geometrical, or logical basis for including the end sheet within the 1946 Cyclopedia. Two renderings attempting to depict the inclusion of the end sheet with L shape detail added to the 1946 Cyclopedia are depicted below:



A POSITA would not find motivation to form an L-shape detail along the slope sheet (as depicted in (a), above), as there is no function served by the form and the L shape

detail would interfere with or otherwise puncture the end slope sheet. Should a POSITA include the end sheet in its entirety at the top of the structure, the sheet would provide a substantial vertical height (b) contrary to the constraints and engineering design considerations discussed above and described by the '892 Patent.

In addition, the proposed combination is unsatisfactory for its intended purpose. The addition of Wong's end sheet with L-shaped detail in the 1946 Cyclopedia would not transfer load directly down to the undercarriage of the car. The 1946 Cyclopedia already has structure for holding up the end slope sheet; and adding a redundant sheet with L-shaped detail would require substantial time investment for the redesign and requisite analyses.

ii. Claim limitation [21]

The Petition concedes that the 1946 Cyclopedia do not teach a “door actuator mounted above said shear plate,...at least partially overhung by said first end slope sheet;...being connected to said door by a mechanical transmission,” and therefore resorts to a Lindström combination without a *KSR*-compliant motivation or workable implementation. Petition 56-59; Viz ¶¶81-89. On this basis, and relying on annotated “space” comparisons, the Institution Decision preliminarily concluded Petitioner had articulated motivation and a reasonable expectation of success. Institution Decision 26-31.

Petitioner argues that because the 1946 Cyclopedia drawings do not depict a particular actuator, a POSITA would treat the choice of mechanism as non-critical and simply adopt Lindström's device. Petition 58-59. But non-criticality is not interchangeability. *KSR* demands a reasoned explanation for why this 1919 actuator, with these shafts, clutches, pinions, and linkages, would be selected to satisfy this claim limitation's three coordinated requirements in the 1946 Cyclopedia's end frame: (1) mounted above the shear plate; (2) at least partially overhung by the first end slope sheet; and (3) connected to the door by a mechanical transmission. Petitioner never offers that claim-specific reasoning; instead, it relies on generic "same field" overlap and the mere existence of empty space. Institution Decision 26-31; Petition 56-59. That approach does not meet the *KSR/Kahn* standard or the Petitioner's burden on [21].

The Institution Decision emphasized that Petitioner's and Dr. Ahmadian's annotations identify a "space" between a shear plate and an end slope sheet in both Lindström and the 1946 Cyclopedia drawings. Institution Decision 29-31. But showing space exists is materially different from demonstrating how a POSITA would:

- mount a multi-element actuator above the shear plate, including selecting mount points, transfer reaction loads to primary structure, and avoid conflicts with end-frame members;

- place the actuator so it is “at least partially overhung” by the 1946 Cyclopedia’s first end slope sheet, while preserving door swing arcs and clearances; and
- connect that actuator to the door by a mechanical transmission, *i.e.*, provide a claim-compliant routing of shafts, clutches, pinions/racks, chains/rods, and levers within the NSC envelope without creating interferences.

Petition 56-59; EX1003 ¶¶59-60; Viz ¶¶84-86. Nothing in the Petition (or EX1003) supplies that installation geometry. Instead, Petitioner offers labels and arrows. The Board’s preliminary acceptance of “similar space” does not answer where the actuator is mounted, how “overhang” is achieved with the NSC end-slope geometry, or how the transmission is routed in the 1946 frame, each of which the claim affirmatively requires. Patent Owner Preliminary Response (“POPR”) 31-33. Dr. Ahmadian did not provide dimensions, clearances, or mounting details for installing a Lindström-style actuator in the 1946 Cyclopedia’s end frame, and he has not performed car-body-level structural analysis for lading containment that could support his feasibility assertions. EX2057 41:1-42:15, 22:8-14, 58:20-59:15; Viz ¶¶86-88.

It is unclear that Lindström’s door-opening mechanism could be added to the 1946 Cyclopedia, or that a POSITA would seek to make such a combination. The Petition fails to address whether Lindström’s door mechanism would fit into the

design of the 1946 Cyclopedia. Viz ¶84. Instead, the Petition merely concludes that such a modification would be possible because “the [1946 Cyclopedia] has a configuration similar to that of Lindström’s car.” Petition 58. Dr. Ahmadian provides no support for the proposition that door mechanisms are interchangeable, or that a POSITA in 2009 would seek to modify a rail car from 1946 to include a door mechanism from 1915. Viz ¶84. A detailed engineering study and analysis would need to be performed that would require more quantitative technical information than what these simple renderings in Lindström show. *Id.* There would have been no expectation of success in the proposed combination of the asserted art.

In addition, despite relying on the photograph of an alleged NSC Ore Car in the 1946 Cyclopedia in other sections, the Petitioner and Dr. Ahmadian ignore the door opening mechanism shown in that photograph. EX1004 at 28. If the 1946 Cyclopedia already depicts a door-opening mechanism, that fact contradicts Petitioner’s premise that the drawings’ silence means “any suitable mechanism would work,” and it raises unanswered questions: what mechanism does the photograph show, does it satisfy [21], and if not, why would a POSITA discard it to import Lindström’s 1919 arrangement? Petitioner never addresses those questions; the absence of such proof cannot be counted in Petitioner’s favor.

iii. Claim limitation [2u]

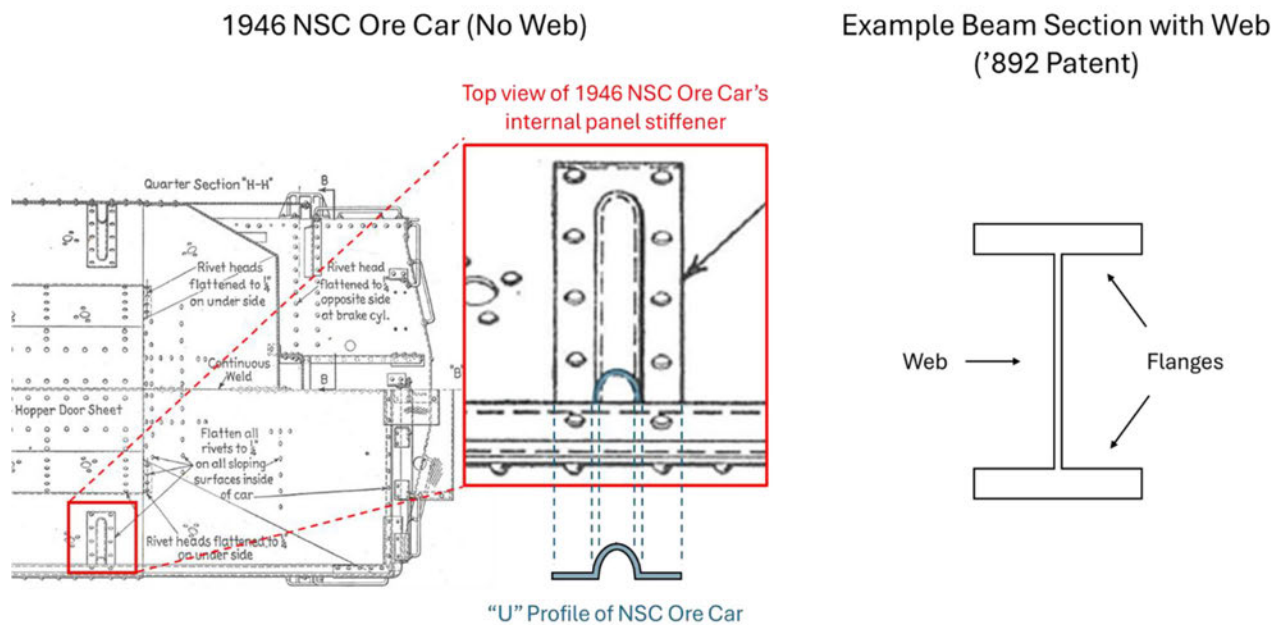
Limitation 2u requires that “said sidewall stiffener [has] web continuity between said first and second portions thereof.” EX1001 24:59–60. Petitioner argues that the 1946 Cyclopedia shows two stiffener portions on opposite faces arranged in the same vertical plane, and that the ’892 Patent “refers to ... alignment in a vertical plane as ‘web continuity.’” Petition 9-14, 32-33, 64-65. The Board preliminarily adopted that view at institution. Institution Decision 31-34.

Petitioner and the Board, focus on one sentence: “Portions 104 and 106 are co-planar, or substantially co-planar, **such that** stiffener member 102 has **web continuity through** member 94.” EX1001, 15:44-46 (emphasis added); Institution Decision 33. The phrase “such that” signals that co-planarity is an enabling condition for the web continuity, not that it is a definition of that term. Immediately thereafter, the patent explains the mechanics: “the vertical stiffener, 102, acts as the web of a T-section, and the local region of the wall section ... functions as the flange,” *i.e.*, a single web path that traverses the sidewall material. EX1001, 15:54-57. Petitioner’s equating of “in a vertical plane” with “web continuity” therefore reverses the specification’s cause-and-effect. Institution Decision 32-34.

“[W]eb continuity” in the ’892 Patent requires two things: *first*, structural elements involved comprise a web and, *second*, this web is “co-planar or substantially co-planar.” ’892 Patent 15:44-45. While “web continuity” requires

alignment, alignment alone does not result in web continuity which requires the inclusion of a unique structural detail referred to as a “web.” A POSITA would have been well-aware that the web of a structural element is the specific component of the structural element which resists shear loading. Viz ¶96.

The structure shown in the 1946 Cyclopedia is not a web as seen in the higher resolution scan of the 1946 Cyclopedia. (EX1054.) The 1946 Cyclopedia has a hat or U-shaped section fastened to the sidewall. The structure defined by Petitioner as a web does not meet the above definition of a web and a POSITA would not identify it as such. Without a web, web continuity cannot be achieved.



Dr. Ahmadian did not identify, in the 1946 Cyclopedia's structure, a single stiffener web that traverses the sheet as the '892 Patent describes. EX2057 127:13-130:21. He also acknowledged that his opinions rely on conceptual renderings and

did not supply the kind of structural mapping or sectional identification that would show a unified web element continuous between the lower and upper stiffener portions through the side wall material. *Id.*, 172:5-20. Those admissions underscore that Petitioner's [2u] showing is label-driven, not evidence-driven.

The Petition fails to present, and Petitioner has not met its burden to show, any asserted art that teaches, suggests, or would have rendered obvious [2u]. Viz ¶90-97.

iv. Claim 2, as a whole

The Petition does not establish by preponderance of evidence that any of [2i], [2l], or [2u] are taught or rendered obvious by the asserted prior art, much less claim 2 as a whole.

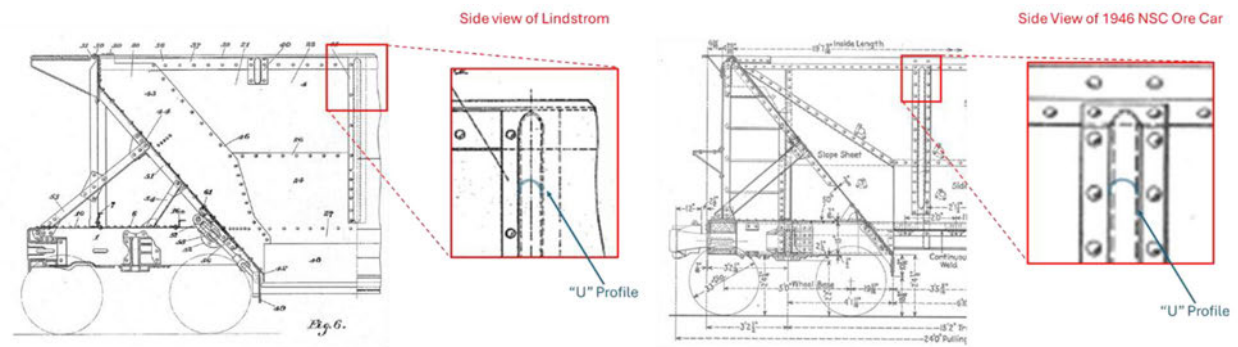
v. Claim 4

Claim 4 adds the limitation "said stiffener having vertical web continuity through the transition portion." EX1001, 25:3-4. Petitioner has not shown that the 1946 Cyclopedia discloses "vertical web continuity through the transition portion," or that the reference teaches the claimed feature. Viz ¶98.

As explained for [2u], "web continuity" requires a continuous web through the side sheet (stiffener acts as the web; local wall region as flange), not mere co-planarity or alignment of separate clips/angles on opposite faces. EX1001 15:44–

57; Institution Decision 32–34. The 1946 Cyclopedia's hat/U and angle pieces are not a single web and therefore cannot exhibit “vertical web continuity” through the transition portion.

Lindström depicts a similar structure to the 1946 Cyclopedia, with a hat or U-shaped section. EX1005 at Fig. 6. As such, there is no web in Lindström. EX1005.



Petitioner has not met its burden to show unpatentability of claim 4 by a preponderance of evidence. Viz. ¶¶98-102.

vi. Claim 5

Claim 5 requires: “the transition portion is located a distance above the first side sill that is in the range of $\frac{1}{4}$ to $\frac{2}{3}$ L,” where L is the “overall height from the first side sill to the first top chord.”

Drawings that are not to scale cannot establish the claimed numeric relationship. Neither Petitioner nor its expert identifies any indication that the figures are drawn to scale; nor do they ground their measurements in reliable, dimensioned engineering drawings. Dr. Viz explains that, as a matter of engineering, one cannot

extract quantitative dimensions from unscaled drawings, yet that is precisely what Petitioner attempts to “prove” the $\frac{1}{4}$ - $\frac{2}{3}$ range. Viz ¶104.

Additionally, Petitioner’s “transition portion” is not consistently identified across the Petition. As PO previously explained (and repeats below, with respect to claim 6), Petitioner’s mapping of the first and second regions and the transition portion shifts over its analysis and at times collapses distinct structures into the same feature, a problem the Petition never cures. POPR, 26-35, 67. If the transition portion is not consistently or correctly located, any measurement to it is arbitrary.

As Dr. Viz explains, a POSITA would not derive the claim 5 ratio by “eyeballing” a non-scale figure, nor would a POSITA undertake “wholesale modifications” to historical cars just to “hit” a target fraction without a reference-based rationale. Viz ¶104. He further explains that real hopper geometry is set by engineering constraints, *e.g.*, commodity angle of repose, hopper discharge efficiency, load paths, and system profiles/clearance rules, not by back-solving to meet a litigation-driven ratio. *Id.*

The Petition’s “design choice” refrain is pure hindsight. The Petition simply declares that a POSITA would “select dimensions” consistent with the 1946 Cyclopedia drawings and Lindström. Petition 117. But Dr. Viz explains that dimensional changes affect load distribution, stiffness, door performance, hydrostatic pressures, and discharge efficacy, and are governed by AAR clearance

plates and depot interfaces, among others, not by aesthetic preference or convenience. Viz ¶104. There is no art-based teaching to “tune” the transition height to the claimed fraction, and no articulated, non-hindsight motivation for doing so. Viz ¶¶103-105.

vii. Claim 6

Petitioner advances irreconcilable constructions of the term “sloped side sheet” across different grounds. In Ground 1b, Petitioner says it will “adopt” PO’s construction (ultimately adopted by the District Court, *see* §VII *supra*) equating “sloped side sheet” with the patent’s side slope sheet 50 – *i.e.*, a separate sheet element, but in Ground 2b Petitioner treats the sloped portion of the sidewall itself as the claimed “sloped side sheet.” These conflicting positions infect Petitioner’s element-by-element mappings, its figures, and its rationale to combine, depriving the PO and Board of the “particularity” the AIA and rules require and collapsing the Grounds that depend on claim 6 (and dependent claim 7).

(1) *Petitioner toggles between two different definitions of “slope side sheet”*

In Ground 1b, Petitioner asserts that it “adopts” PO’s construction—the same construction Petitioner fought in district court—under which a “sloped side sheet” is a distinct, separate sheet element, corresponding to the side slope sheet 50 disclosed in the ’892 Patent. Petition 68-69. Having adopted that construction,

Petitioner was required to identify a first sloped side sheet that “meets” the sidewall at the transition portion.

In Ground 2b, Petitioner discards the construction it had “adopted” for Ground 1b and instead treats the sloped portion of the sidewall itself as the claimed “sloped side sheet.” Petition 118-20; EX1003 ¶84; Viz ¶106. This new definition directly contradicts Petitioner’s Ground 1b position, because under this alternative construction: there is no sheet distinct from the sidewall; there is no separate structure that can “meet” the transition portion; and the claim language requiring two sloped side sheets is impossible to satisfy. This contradiction is fatal because under Petitioner’s Ground 2b definition, the claimed “sloped side sheet” and the transition portion would be the same structure, which is nonsensical under the plain language.

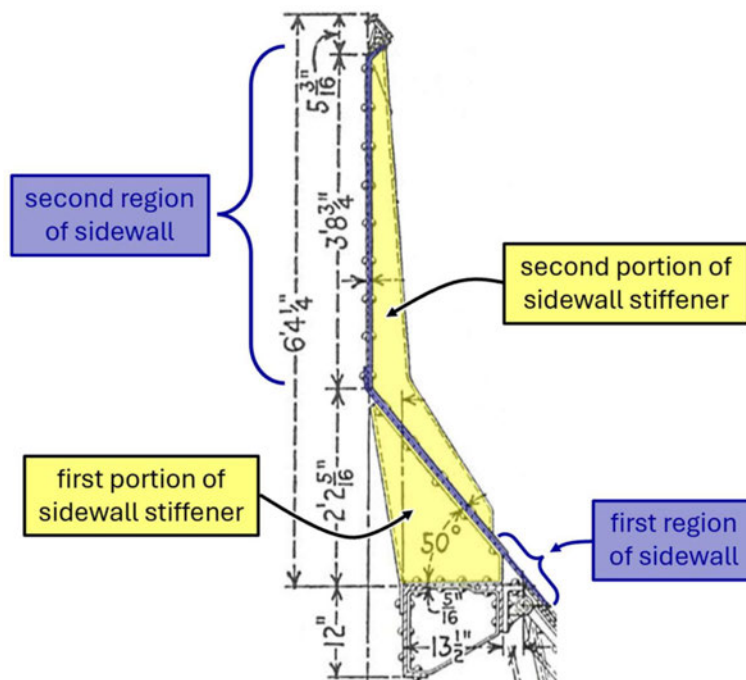
The Board’s institution decision explicitly noted that it did not resolve the construction of this term and anticipated further development during trial. Now, with the full record before it, the Board should reject Petitioner’s attempt to toggle between incompatible constructions depending on which ground is being argued.

(2) Under any plausible construction, Petitioner fails to establish that the prior art teaches or renders obvious claim limitation [6b]

[6b] adds the limitation: “said hopper includes first and second sloped side sheets; and said first sloped side sheet meets said first sidewall at said transition portion.” EX1001 25:16-19; Petition 68. The Petition fails to show that [6b] would

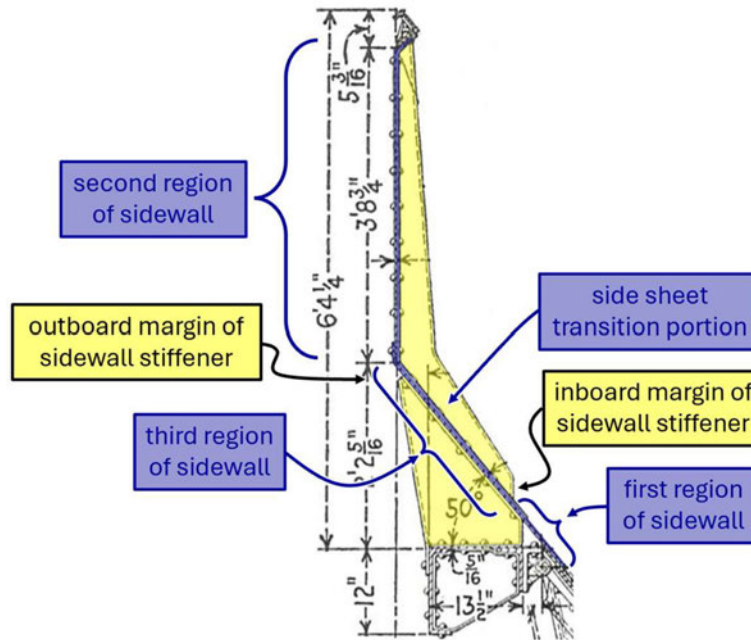
have been rendered obvious by the asserted art, or that it would have been obvious to include [6b] in the 1946 Cyclopedia. Viz ¶¶106-116.

Petitioner initially identifies the following annotated structures in the 1946 Cyclopedia as providing the claimed “first portion” and “second portion” of the “sidewall stiffener” and “first region” and “second region” of the “sidewall” (Petition 29, 63):



Viz ¶108.

Petitioner also identifies the following annotated structures in the 1946 Cyclopedia as providing the claimed “third region” and “side sheet transition portion” (Petition 66):



Viz ¶109.

Petitioner relies on Lindström to show that which is missing from the 1946 Cyclopedia. Viz ¶111. At a minimum, Lindström does not teach or suggest the claimed “sloped side sheet.” *Id.*

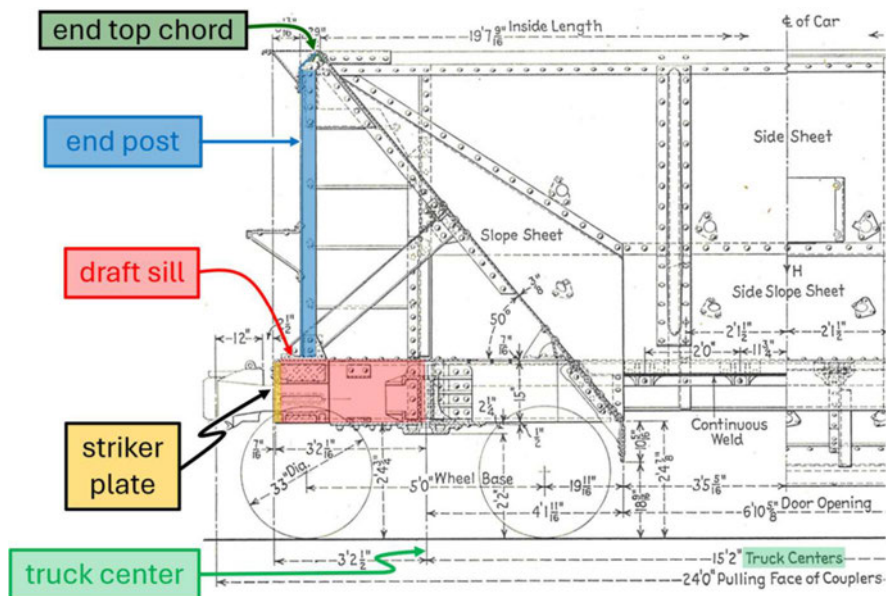
Petitioner and Dr. Ahmadian pick and choose pieces from each of the references to argue that a POSITA would seek to make the 1946 Cyclopedia’s side wall “wrap around” its “lower stiffener.” Viz ¶112. Petitioner argues that a POSITA would, based on Lindström, (1) wrap the sidewall of the 1946 Cyclopedia around the lower portion of the alleged sidewall stiffener and (2) add back a sloped side sheet that was removed to wrap the side wall around the alleged sidewall stiffener. Viz ¶113.

PATENT OWNER'S RESPONSE

Petitioner fails to provide any reasonable basis or rationale for its proposed modifications. Instead, the Petitioner merely uses the disclosure and teachings of the '892 Patent as a roadmap to improperly modify the asserted art to arrive at the claimed subject matter. Viz ¶¶114-116.

viii. Claim 8

Claim 8 adds two requirements to claim 2: [8a] “the hopper has a cross-wise extending outboard end top chord”; and [8b] “an end post extends from the draft sill to the end top chord, the end post being mounted above the draft sill between the truck center and the striker.” Petitioner identifies the below annotated slice of the 1946 Cyclopedia schematic and asserts (i) the drawing shows an “end top chord,” and (ii) an “end post” that extends from the draft sill to that chord in the required longitudinal zone:



Petition 71-72.

Limitation [8b] demands the following: an end post; extends from the draft sill to the end top chord; is mounted above the draft sill; and is between the truck center and the striker. The Petition's two annotated snippets (Petition 71-72) cannot satisfy these conjunctive requirements for three independent reasons.

First, Petitioner's annotations do not establish a continuous structural member that extends from the draft sill all the way to the end top chord. The graphics show proximity but do not identify how (or that) the post's lower end originates from the draft sill rather than an intervening cover plate, weldment, or sub-structure; nor do they show an unambiguous upper termination at the chord (as opposed to a gusset or web under the chord). Viz ¶121.

Second, the Petition asserts the post lies in the window "between truck center and striker" without tying the post's base and run to those references on the very drawing from which the claim limitations 2(f)-(g) positions are derived. Viz ¶121; *compare* Petition 41-46 (2f-2g) with 71-72 (8b).

Third, even crediting the locations that Petitioner labels, the Petition never proves that the alleged end post is *mounted* above the draft sill (as opposed to on or through structure at the sill level). Petitioner conflates mounting to extends-from/to by inference, not evidence. Viz ¶190.

ix. Claim 11

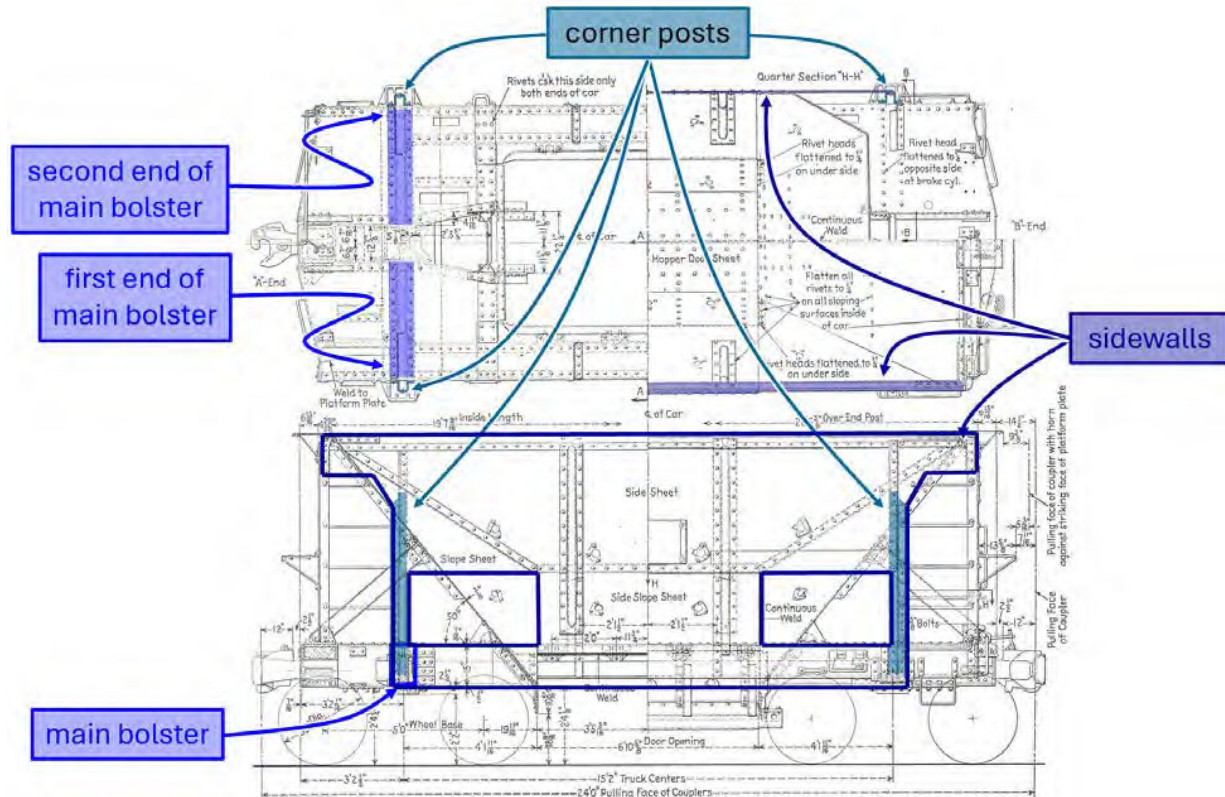
Claim 11 depends on claim 10 and requires that “the main bolster has first and second ends; and first and second corner posts extend upwardly from said first and second ends respectively to mate with said sidewalls.” Petitioner relies on annotated slices of the 1946 Cyclopedia schematic/photograph to assert that the drawing shows corner posts that extend from the ends of the main bolster and mate with the sidewalls. Petition 73-74. That showing fails for multiple reasons.

In discussing earlier limitations, Petitioner identifies the blue-outlined “sidewalls” to include the two corner posts themselves. Petition 20-22, 39. Later, to satisfy claim 11, Petitioner points to those same members as “corner posts” that extend upwardly to mate with said sidewalls. Petition 73. If the posts are already part of the sidewall, they cannot also “mate with said sidewalls,” as claim 11 requires a post-to-sidewall interface. PO highlighted this contradiction: the Petition’s own figures alternately include and exclude the posts from the “sidewall,” producing an equivocal and self-defeating mapping for claim 11. PO Prelim. Resp. 48-51, Viz ¶¶124-127.

The Petition, in its discussion of [1b], asserts that the structures highlighted in blue in the figure below (reproduced from the Petition 20) correspond to the claimed “sidewalls.”



Petition 20-22, 39. In direct contradiction with the plain language of claim 11 (“first and second corner ports ... mate with said sidewalls”) the structures the Petition identifies as the claimed “sidewall” **include** the two corner posts towards the sides of the rail car, as shown in the above figure and confirmed later in the Petition and Dr. Ahmadian’s declaration:

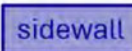


Petition 73; EX1003 ¶¶88; Viz ¶¶124-127. Thus, the structure identified in the Petition as the “sidewall” in the 1946 Cyclopedia, which includes the two posts, cannot reasonably be construed to satisfy the language of claim 11 – *i.e.*, “first and second corner ports ... mate with said sidewalls.” Petition 20.

The Petition also relies on the following image to show the sidewalls, but does not indicate the posts to be part of the structures it identified as sidewalls, shown outlined in blue:



sidewall



corner post

main bolster

Section "B-B"

Petitioner is thus unclear regarding what it identifies as the sidewalls in the cited asserted art. *Viz* ¶126. That ambiguity is carried forward to claim 11. *Id.*; Petition 73, 74. If the Petition's analysis of the asserted art is to be interpreted to have the corner posts as part of the sidewall, then it is impossible for the corner posts to "extend upwardly from said first and second ends respectively to mate with said sidewalls," as required by claim 11. *Viz* ¶126.

Thus, under the Petitioner's proposed interpretation of the "sidewall" in the 1946 Cyclopedia, Petition 20, it is clear that the asserted art does not teach or render obvious claim 11. Moreover, because the Petition has provided conflicting interpretations of the asserted art with respect to the claimed "sidewall," it is unclear how the asserted art might teach or render obvious the claim. Petitioner has not met its burden to show a reasonable likelihood that this claim is invalid. *Viz* ¶¶124-127.

Even overlooking Petitioner's definitional flip-flop, the cited images do not establish the two conjunctive relationships claim 11 imposes. First, regarding "extend[ing] upwardly from said first and second ends" (of the main bolster), Petitioner gestures at vertical members near the car corners but does not show (with the same dimensional clarity it used for truck center/striker) that those members originate from the bolster's ends. Petitioner never ties the alleged posts' lower terminus to the bolster end stations identified elsewhere in its claim 2 mapping, nor

does it rule out intervening structure (*e.g.*, cover plates/gussets) between the bolster and the member's base. Petition 73-75; Viz ¶¶124-127.

Second, regarding the term "... to mate with said sidewalls," as discussed above, Petitioner's images alternately include the posts within the "sidewall" silhouette and exclude them. When included, no post-to-sidewall interface remains to "mate" with; when excluded, Petitioner still does not identify a discernible joint or attachment interface showing "mating" to the sidewall (as opposed to an end sheet, gusset, or chord assembly). POPR 41-44; Viz ¶¶124-127.

x. Claim 12

Dependent claim 12 includes the same additional limitations as dependent claim 11 but depends directly on claim 2. Petitioner's Ground 1b mapping fails for the same reasons it fails for claim 11, and the different dependency path does not cure the evidentiary gaps.

xi. The Petition has not met its burden with respect to Ground 1b

At least for the reasons discussed above, the Petition does not establish unpatentability of any of claims 2-8 or 10-14 by preponderance of the evidence on Ground 1b and this ground should be rejected.

B. Ground 1c

Ground 1c asserts that claim 9 is obvious over the 1946 Cyclopedia in view of Lindström and Wong.

i. Claim limitation [9a]

[9a] adds to the inventions of claims 2 and 8 that “said hopper has an end wall extending downward of said top chord.” Viz ¶130. Petitioner admits that the 1946 Cyclopedia does not disclose this limitation and relies on Wong to supply this missing element. Petition 76; Viz ¶131. However, a POSITA would neither have any reason nor be motivated to include an end wall in the 1946 Cyclopedia based on Wong. Viz ¶¶130-135; *see also* [2i] discussion, §VIII.A.i. *supra*.

Petitioner suggests adding an end wall to the 1946 Cyclopedia (from Wong) and forming a hollow beam at the wall/slope-sheet interface by bending that end wall, contending this would be an obvious, “finite options,” routine modification in the same field. Petition 76-82. The developed record refutes that narrative and shows no motivation and no reasonable expectation of success for Petitioner’s combination, as well as missing proof of the “hollow cross-section located where the meeting occurs.”

First, Petitioner contends that the 1946 Cyclopedia could be modified by increasing the overall height of the hopper. Petition 77. However, railcars are based on standardized sizes or profiles, which cannot be exceeded. Viz. ¶132. Dr. Viz

explains that modifying the 1946 Cyclopedias by raising the hopper height or reducing the slope-sheet angle (two methods Petitioner proposes for accommodating an added end wall) is not a routine “design choice,” but is constrained by a multitude of factors. *Viz* ¶¶132-133; EX2055. Changing the height of a car can leave it ineffectual for its intended purpose, e.g., by not being able to carry its full intended load due to the increased structural weight. In addition, raising the height on a design like that of the 125-year-old L&Y Hopper Car as Petitioner proposes, which already had end walls, would have been vastly different than adding end walls and raising the height. Petition 81.

Second, Petitioner suggests reducing the inclination of the slope sheets so that their outboard ends terminate at a lower height (*i.e.*, lower along the end wall). Petition 77. Again, rail cars are specifically designed with geometries and load capacities in mind. *Viz* ¶133. Lowering the slope sheet as proposed in the modified image provided in the Petition, 77, would have changed load distribution in the railcar. *Viz* ¶133. Moreover, it might have lowered the effectiveness of the railcar when dumping its load because the lower angle may not be sufficient to gravity drop all its contents based on characteristics such as the angle of repose of the intended commodity. *Id.* A POSITA would also have to address the hydrostatic pressure from the commodity “pushing out” on the hopper walls. *Id.*

Petitioner's articulated reason is capacity/field-of-end endeavor overlap. But Wong is principally about joining aluminum car-body to steel end structure while avoiding galvanic corrosion, not about adding end walls to increase capacity on steel ore cars, an objective absent from the 1946 Cyclopedia disclosures. *Viz* ¶¶68-70. Petitioner thus proceeds by general similarity plus an outcome (more volume) the '892 Patent identifies, not by a teaching or problem in the art that would have prompted the specific 1946 Cyclopedia-plus-Wong hybrid it proposes. POPR, 45-47 (claim 9 discussion).

The full record shows no non-hindsight rationale to add an end wall and no analysis addressing the clearance/geometry impacts a POSITA must consider. *C.f.*, Institution Decision 19-31 (obviousness discussions); 37-38 (general institution).

For at least these reasons, the asserted art combination proposed by the Petition would not be one of a "finite number of well-understood options" or a "routine design choice." *Viz* ¶¶130-135; Petition 80-81. Instead, the Petition and Dr. Ahmadian are merely engaging in more improper hindsight and picking and choosing pieces of the asserted art in an attempt to meet the claimed invention. *Viz* ¶134. This is shown by the different rail car designs that Petitioner relies on as allegedly showing other rail cars with end walls. *Id.* Petition 78-80.

Petitioner has not met its burden to show a reasonable likelihood that this claim limitation is taught or rendered obvious by the asserted art, much less claim 9 as a whole. Viz ¶¶130-135.

ii. Claim limitation [9b]

Limitation [9b] requires, in part: "...said first cross-wise extending beam is located where said downwardly extending end wall meets said first end slope sheet; and said first cross-wise extending beam is of hollow cross-section." Petition 82. [9b] requires the following, at the same location: (1) the upper, outboard end of the first end slope sheet meets the downwardly extending end wall; (2) the first cross-wise beam is located where that meeting occurs; and (3) that beam is of hollow cross-section.

Wong's L-shaped detail is not, and cannot be equated to, the '892 Patent's "first cross-wise beam." [2i], §VIII.A.i. *supra*. Petition never shows it is a "reinforcing" beam "located where the meeting occurs."

The Petition's annotated images rely on visual inference, not on dimensioned evidence, weld lines, or a continuous hollow section co-located with the exact end-wall/slope-sheet meeting on the 1946 Cyclopedia. Petitioner's expert did not perform any CAD/FEA or interface geometry analysis to establish this co-location or to verify that the "hollow" geometry would exist at that joint in the modified NSC design.

Even setting aside the “steel/aluminum” purpose mismatch, Petitioner never engages with interference/fit concerns created by the added end-wall fold and joint hardware at the upper outboard end of the 1946 Cyclopedia slope sheet; altering the joint by “bending” the wall (as Petitioner proposes) can conflict with existing stiffeners and flanges, and would need re-fastening methods the Petition nowhere describes. *Viz* ¶¶136-138 ([9b] critique). The absence of a credible, practicable path is especially problematic because [9b] ties all three features to one location, if the geometry or fit is off, all three fail together.

The Board cited the need for rational underpinning and expectation of success for Petitioner’s obviousness arguments. Institution Decision 23-31 (*e.g.*, [2i] and [2l] analysis). On this record, Petitioner’s [9b] mapping lacks the required co-located “meeting-and-hollow-beam” proof and rests on conclusory hand-drawn modifications, not engineering analysis or art-based teaching.

C. Ground 1d

Ground 1d asserts that claim 15 is obvious over the 1946 Cyclopedia in view of Lindström, optionally Wong, and Coates.

Claim 15 narrows claim 2 by requiring that the first and second portions of the sidewall stiffener are made of flat bar, positioned in vertical-transverse planes, substantially co-planar, and substantially vertically aligned in a sectional view. Petitioner’s Ground 1d argument contends that the 1946 Cyclopedia as modified by

Lindström supplies the non-“flat bar” features and then relies on Coates (photos of an early-1900s L&Y hopper to provide the “flat bar” material limitation. Petition 84-86).

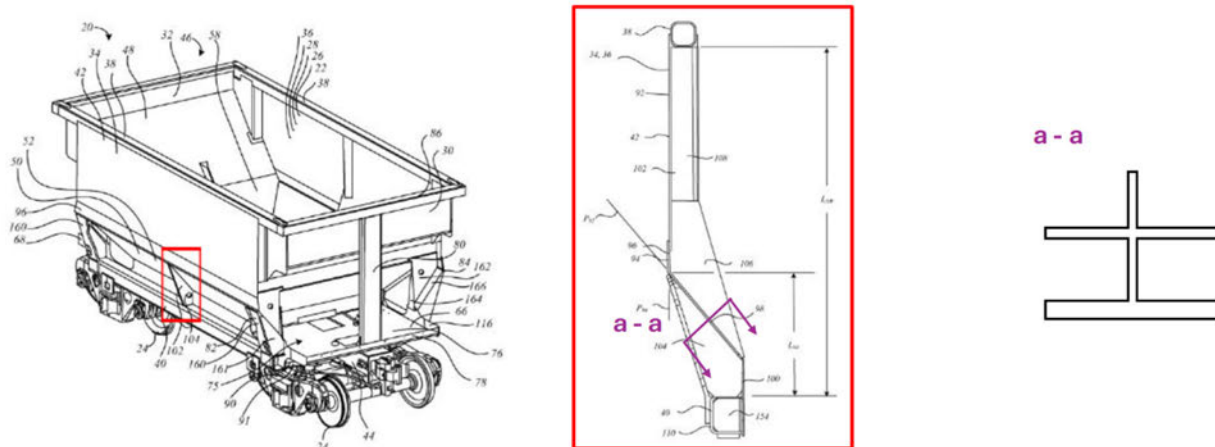
Petitioner points to Coates’ historical photographs and asserts the lower exterior portion of the side stiffener is a “triangular flat bar,” and the upper interior portion is a “generally rectangular flat bar.” But neither the text nor the photographs in Coates identify the material form as “flat bar.” Moreover, the Petition supplies no material callout, no specification sheet, no dimensioned section (*e.g.*, a bar-stock width × thickness), and no manufacturing source showing the members in Coates are “flat bar.” That is not just a weight-of-the-evidence issue; it is an absence of proof on an expressly recited material-form limitation.

Even assuming Coates did disclose “flat bar,” Petitioner says only that flat bar is “common” and “inexpensive” and therefore a POSITA would have used it. Petition 85-86. That is *ipse dixit*, not a *KSR*-compliant rationale. Dr. Viz explains why the choice of stiffener stock and section is not a mere commodity swap: the lower, exterior portion in the 1946 Cyclopedia/Lindström configuration is a structural member working with side-sheet geometry, fasteners, and local flanges. Changing it to “flat bar” changes stiffness, connection geometry, and load paths (out-of-plane bending, local buckling, rivet/weld land) and would require redesign, not a routine substitution. *Viz* ¶¶101-104; POPR, 56-58.

This deficiency is magnified because Petitioner already leans on Lindström to supply vertical-alignment/web-continuity features and then uses Coates for material form, a stitching-together of disparate, century-apart designs with no articulated reason a POSITA would have combined those aspects for a hopper like the 1946 Cyclopedia. Petition 84-86.

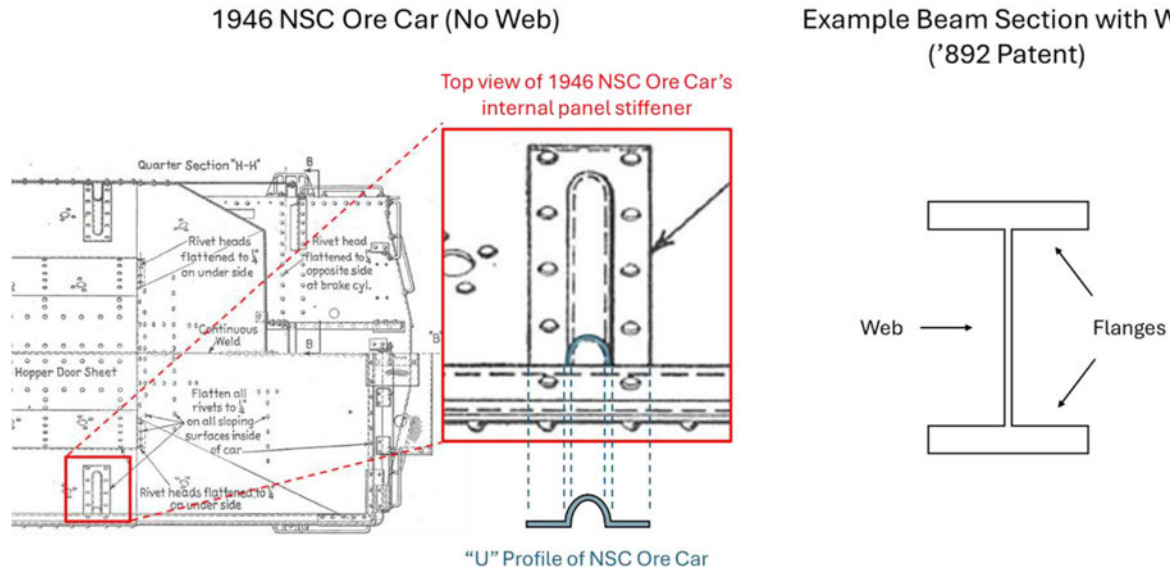
i. The asserted art does not render obvious claim 15

Claim 15 identifies that the sidewall stiffener comprises a flat bar. In combination with the definition of web continuity provided in the specification, this establishes that the shape described by Claim 15 comprises the web of an I-beam:



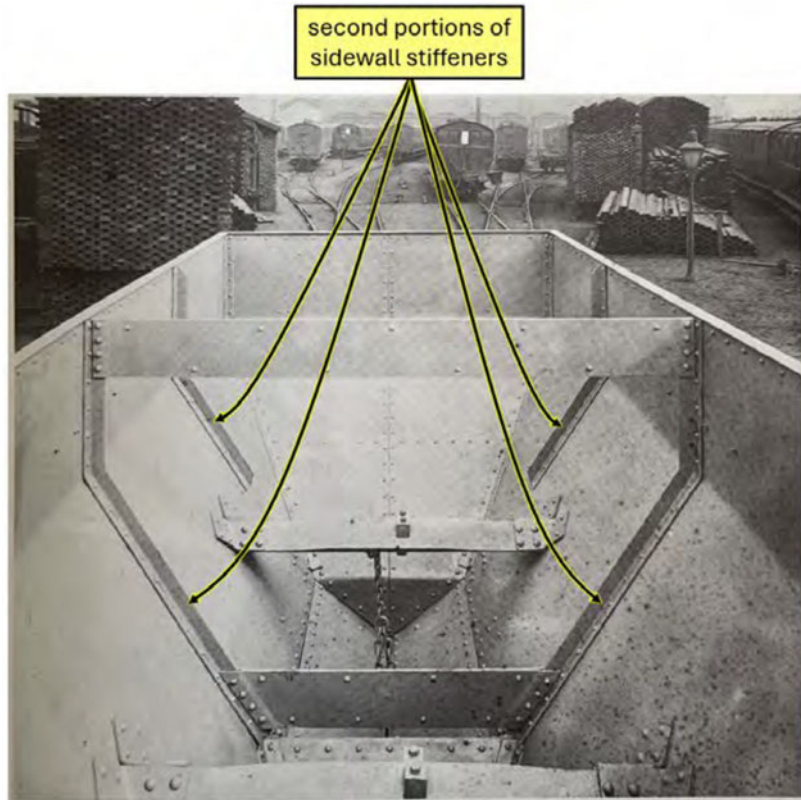
'892 Patent

As described in §VIII.B.ii. for [2u], the 1946 Cyclopedia's structure is hat or U-shaped and does not have a web. Thus, the 1946 Cyclopedia does not disclose a sidewall stiffener “made of flat bar” as required by claim 15:



Petitioner and Dr. Ahmadian do not explain why Coates' discussion of the L&Y Hopper Car teaches "flat bar." Viz. ¶141. Instead, they present the conclusion that it is flat bar as mere *ipse dixit*. *Id.*

Moreover, that the Petition does not provide any reasonable basis or rationale as to why a POSITA would modify the 1946 Cyclopedia in view of Lindström and optionally Wong with Coates, as proposed by the Petitioner. *Id.* 142.



Petition 86.

Further, it would not be clear to a POSITA in the relevant time frame, that the photos of the L&Y car show the use of flat bar as the Petitioner and Dr. Ahmadian claim. Viz ¶143.

D. Ground 2b

Ground 2b asserts that claims 2-14 are obvious over Lindström in view of the 1946 Cyclopedia and Wong, flipping “primary” references. Regardless of the primary reference, the same rationale and rebuttals set forth above for claims 2-14, in §VIII.A. and §VIII.B., apply for Ground 2b.

i. Claim limitation [2i]

Petitioner cites its discussion for Ground 1b for [2i]'s "said upper, longitudinally outboard end of said first end slope sheet being reinforced by a first cross-wise extending beam." The same arguments that refute this combination for [2i] in §VIII.A.iVIII.A.i apply here.

Petitioner proposes to modify Lindström's end structure by importing from Wong the end sheet 24 with L-shaped detail positioned under the upper end of the slope sheet, asserting this would have been a straightforward, field-of-end endeavor combination with a reasonable expectation of success. Petition 106-108; 113-115 (relying on Wong's Fig. 4).

Petitioner misreads Wong: the cited L-shaped detail is part of an end sheet that ties to an upper portion of an end slope sheet. Petitioner's theory treats Wong's end sheet 24 with L-shaped detail at the slope-sheet/end-sheet interface as the '892 Patent's "first cross-wise extending beam." But as Dr. Viz explains, Wong addresses a steel end structure joined to an aluminum car body, and the L-shaped detail there is part of a sheet-to-sheet joint used for lading containment and corrosion control, not a separate reinforcement beam added to strengthen the slope sheet. Indeed, a POSITA would have understood Wong to teach against using the L-shaped detail for reinforcement or support, particularly because Wong includes a plurality of

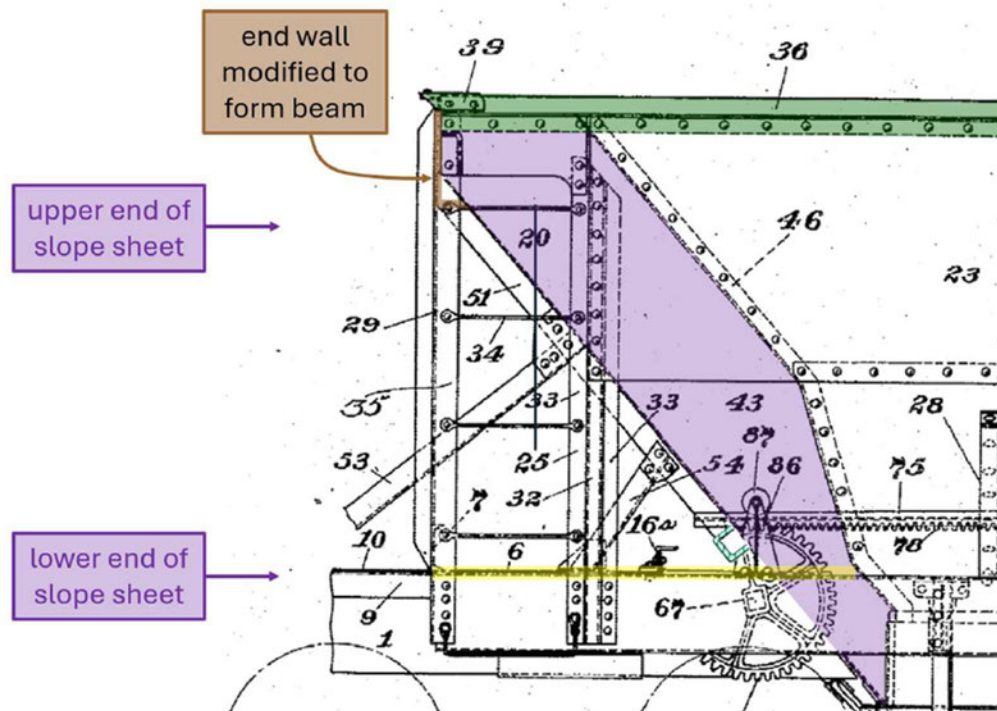
aluminum channel stiffener members 66 welded to the end slope sheets for this purpose. EX1006, 4:50-56.

A POSITA would not equate Wong's joint detail with the '892 Patent's reinforcing member; the purposes and problems addressed differ. Viz ¶¶149-151. The Petition never bridges that gap with evidence; instead it labels Wong's joint "a cross-wise beam" and assumes it performs the '892 Patent function—an assumption, not proof. Petition 52.

The full record now includes Dr. Viz's explanation of Wong's true focus (steel/aluminum joining) and the lack of reinforcement teaching, which refutes that Wong's interface detail is the '892 Patent-style beam Petitioner needs.

Even putting purpose aside, Petitioner's proposed "slight lengthening and bending" of Lindström's end wall to emulate Wong's cross-member runs head-on into Lindström's existing structure, including outwardly extending stiffening flanges (51) that occupy the very space where Petitioner wants to insert the new beam. Dr. Viz shows the conflict graphically and explains that simply "bending" Lindström's end wall is not enough, a POSITA would still need a viable fastening path to the slope sheet, which the Petition does not supply. Viz ¶150 (identifying flanges 51 interference; need for fastening); Petition 106-107 (proposed end-wall bending). In short, Lindström's disclosed components block Petitioner's add-on beam, and the Petition's "straightforward addition" is neither shown nor supported.

A POSITA would not have “slightly lengthened and bent” Lindström’s end wall based on Wong, as proposed by the Petition. Petition 106-07; Viz ¶¶150-151. The Petition provides no explanation and it is not clear from the asserted art how this would have been accomplished given that outwardly extending stiffening flanges 51 appear to be directly in the way of the proposed modification:



Petition 107; Viz ¶150.

Moreover, simply bending the end of the end wall is not enough to meet the claim limitation. *Id.* A POSITA would need to have a way to fasten this new detail to the slope sheet. *Id.* Putting a C-channel or similar bend detail into the bottom of the end wall could make it challenging or even impossible to properly fasten it to the

slope sheet. *Id.* Petitioner and Dr. Ahmadian need to consider more than just whether a member such as the end wall can be shaped differently at one edge. *Id.*

Petitioner's "because they're in the same field" rationale is not enough. For Ground 2b, the Petition never articulates why a POSITA would modify Lindström's end structure in this particular way, nor does it address the trade-offs (changed load paths, interference with flanges 51, new fastening details, end-wall integrity) that a POSITA must solve to achieve a functioning assembly. Petition 106-108; *Viz* ¶¶150-152 (practical obstacles).

And critically, Dr. Ahmadian did no CAD modeling, no finite-element analysis, and no dimensioned interface work to show the proposed beam can actually be implemented in Lindström with the claimed reinforcing function. EX2057 60:4-19. His method relies on annotated imagery and inference, not on engineering proof. On this record, Petitioner has not shown a POSITA would have had a reasonable expectation of success, particularly where the modification collides with Lindström's disclosed flanges (51) and fastening layout. *Viz* ¶¶150-152.

ii. Claim limitation [2j]

Petitioner cites its discussion for Ground 1b as providing support to combine the asserted art to provide "said lower, longitudinally inboard end of said first end slope sheet being reinforced by a second cross-wise extending beam." However, the Petition does not make an argument in Ground 1b regarding adding a lower,

longitudinally inboard end of said first end slope sheet being reinforced by a second cross-wise extending beam from Wong. Viz ¶153; Petition 54-55.

In Ground 2b, Petitioner purports to add a second cross-wise beam to Lindström by borrowing channel-shaped members from Wong, asserting that a POSITA would have implemented such a feature at the lower, inboard end of the first end slope sheet. Petition 108-109. That theory fails for three independent reasons: (1) Petitioner does not actually map a second beam at the claimed location; (2) the proposed insertion conflicts with Lindström's geometry and fastening scheme; and (3) Petitioner provides no *KSR*-compliant rationale or engineering analysis establishing a reasonable expectation of success.

Petitioner's Ground 2b discussion points generally to Wong's channel members and to its own prior arguments, but it does not identify a second cross-wise beam located at the lower, inboard end of the first end slope sheet in Lindström as modified. Dr. Viz explains that, among the various Wong channels Petitioner gestures at, only channel 68 is actually positioned on a lower, inboard end of an end slope, and even then, the Petition does not show that part transplanted into Lindström at the claimed location and serving as a reinforcing beam for Lindström's first end slope sheet. Petition 108-109. The Petition's selection is cherry-picked from disparate contexts and never tied to the precise "lower, longitudinally inboard end" requirement of [2j]. Viz ¶¶154-155.

Compounding matters, the Petition appears to incorporate by reference arguments from Ground 1b to satisfy [2j] in Ground 2b, but those earlier pages do not present a coherent second-beam mapping for Lindström and Wong either; the cited sections are misdirected and do not demonstrate the claimed location or function. Viz ¶153; Petition 108-109.

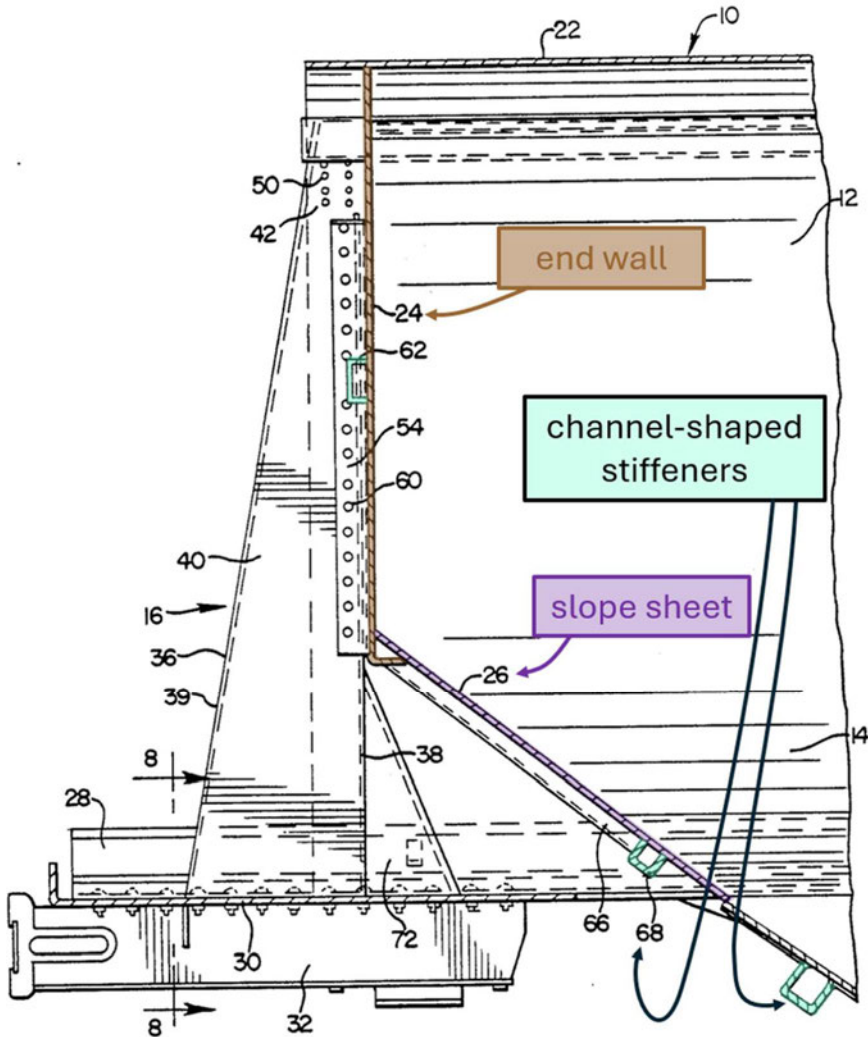
Even setting location aside, Dr. Viz shows that inserting a second cross-wise beam at Lindström's lower, inboard end would physically conflict with Lindström's outwardly-extending stiffening flanges 51 and the door/slope-sheet geometry in the very zone where Petitioner wants the new member. Viz ¶156. Petitioner's annotated art positions the "second beam" in mid-air, without a credible connection path to either transfer load or integrate with the existing fastening scheme; in other words, the Petition draws a floating channel in a location already occupied by structural features critical to Lindström's integrity. *Id* ("hovering in the air ... would not have provided any benefit to transferring forces").

Petitioner never supplies the necessary fastening detail (welds, rivet lands, brackets) or a revised interface description to reconcile the added channel with flanges 51 and the surrounding hardware. That is not a mere dispute over weight; it is an absence of proof that the proposed second beam could be implemented in Lindström at all, much less at the claimed location and performing the reinforcing function for the first end slope sheet. Viz ¶¶154-158.

The Petition's rationale is little more than field-of-effort overlap and the assertion that adding channels is a familiar technique. But *KSR* demands a reasoned explanation tied to the problem and constraints of the target design. Here, Petitioner does not address the consequences to load paths, door framing, local buckling, or clearances that follow from adding a second cross-wise beam in Lindström; nor does it propose a new fastening scheme or show the modification would still function as intended. Petition 106-109, 113-116; Viz ¶¶154-158.

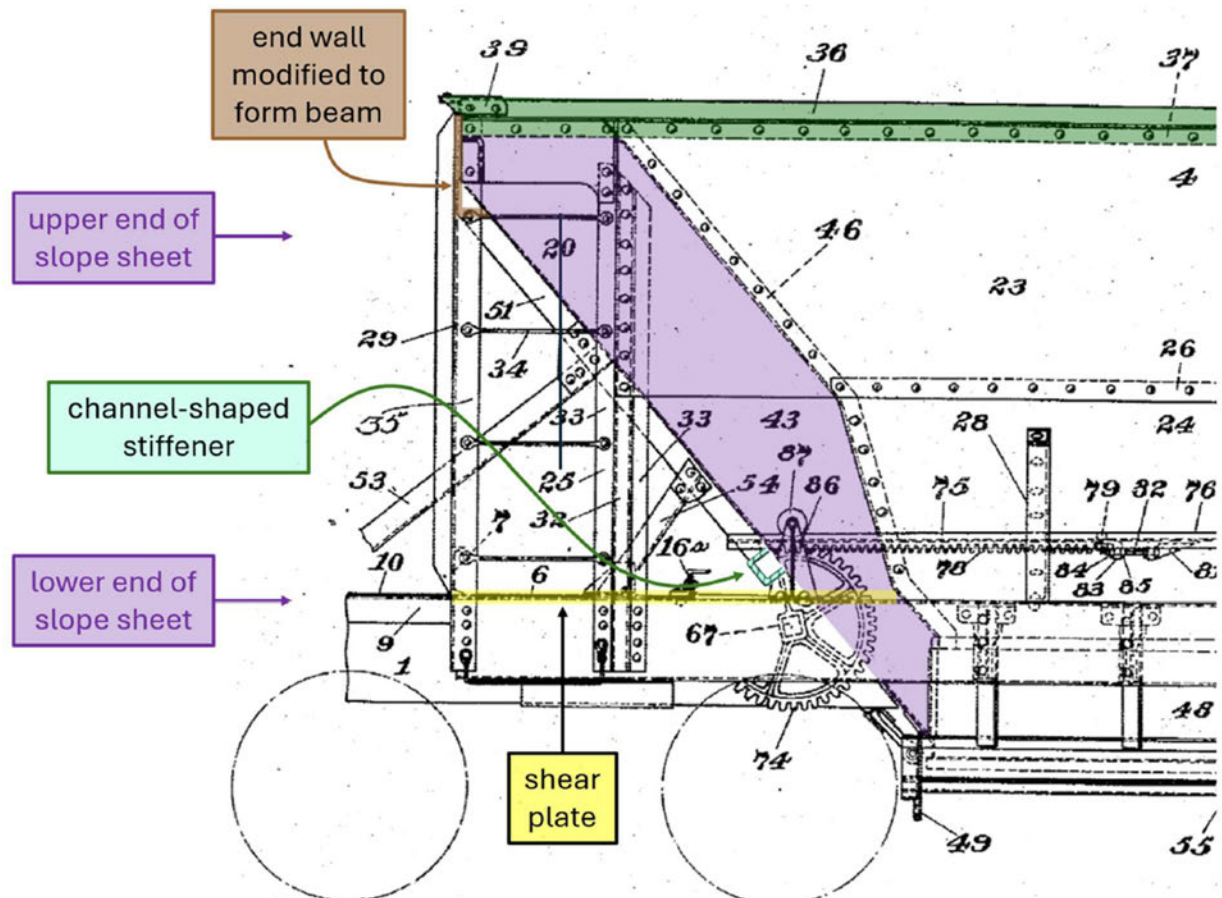
To the extent Petitioner is incorporating its arguments as to why it is adding any beam from Wong to Lindström or the 1946 Cyclopedia, this only further highlights the improper hindsight basis for Petitioner's arguments. Viz ¶¶155-158. For the same reasons why a POSITA would not have added a first cross-wise extending beam at the upper, longitudinally outboard end of said first end slope sheet in the 1946 Cyclopedia or Lindström, a POSITA would not have added the second cross-wise extending beam proposed by the Petition. *Id.* Moreover, the Petition does not provide any reasonable basis or rationale regarding interference that might result from the addition, nor how such interference introduced by addition of this proposed second cross-wise extending beam might be addressed by a POSITA. *Id.*

For example, Petitioner appears to suggest that the channel-shaped stiffener 62, channel-shaped stiffener 68, or the unlabeled channel shaped stiffener on the door of the hopper car may be added to Lindström:



Petition 108; Viz ¶55. However, only one of these channel-shaped stiffeners, with reference number 68, is on “said lower, longitudinally inboard end of said first end slope sheet” as required by the claim. *See id.* Petitioner is improperly cherry-picking features from the asserted art using the claims as a road map to try to invalidate the claims, without taking into consideration whether the proposed combination would have been obvious to a POSITA, or whether a POSITA would have been motivated in the first place to attempt to modify the asserted art as proposed in the Petition.

The Petition fails to consider the impact that adding a beam in the location it chose on Lindstrom might have on other structures in the rail car, or the car as a whole:



Petition 109; Viz ¶156. As seen above, the proposed addition would be entirely in the location of outwardly extending stiffening flanges 51 and would likely destroy the structural integrity of Lindström's slope sheet. *Id.* Moreover, the addition would hover in the air and, thus, would not have provided any benefit to the rail car or its operation. *Id.*

Thus, not only does the Petition use improper hindsight based on the '892 Patent, but the modification to the asserted art proposed in the Petition would have rendered the resultant rail car unsatisfactory for its intended purpose. *Id.* ¶157.

iii. Claim limitation [2r]

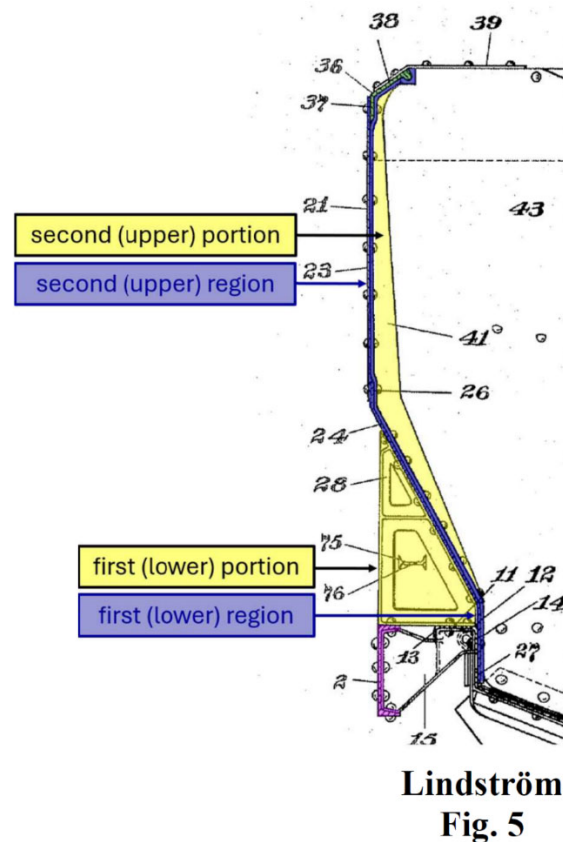
In Ground 2b, Petitioner asserts that Lindström, as further modified by the 1946 Cyclopedia and Wong, satisfies this “lower-to-first-region/upper-to-second-region” mounting relationship. Petitioner relies on its discussion of [1g] for [2r], and adds no further analysis. Petition at 114.

Petitioner never establishes that Lindström's lower stiffener portion is mounted to the “first region” (the vertical sidewall region), as the claim requires. Dr. Viz explains that Petitioner imports its showing for [1g] into Ground 2b to cover [2r], but Lindström's fasteners at the lower end are not shown as mounting to the first region (the vertical sidewall). Instead, they attach into the inclined transition portion, missing the claim's express requirement. Petitioner offers no corrected mapping in Ground 2b to cure this defect.

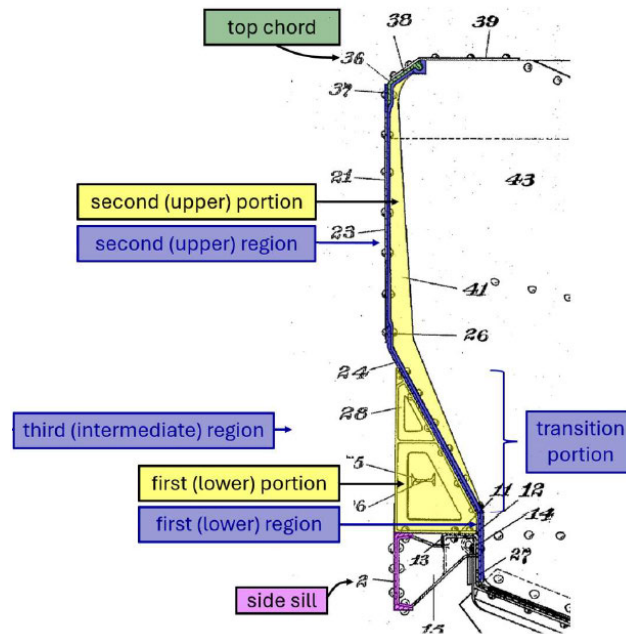
Petitioner also fails to show the upper stiffener portion is “mounted to the second region” (the upper sidewall region) in the asserted combination. Petitioner's Ground 2b discussion does not identify where the upper portion is mounted to the second region of the sidewall. The Petition either treats the transition area itself as part of the “upper region” or relies on the same ambiguous annotations used

elsewhere, never tying the upper portion of the stiffener to the second region as opposed to the transition. That is fatal to [2r], which demands a two-region mounting explicitly recited in the claim. Viz ¶163.

Petitioner contends the following annotated image allegedly shows the sidewall stiffener mounted to the first (lower) region:



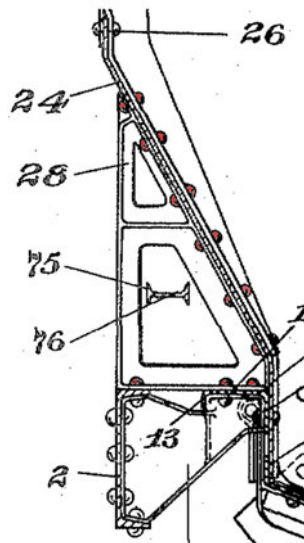
Petition 95 (modified to make image smaller); Viz ¶160. As is made clear by Petitioner's discussion of claim 4, the first (lower) region is the lower vertical portion of the sidewall, and not the diagonal transition portion:



Lindström
Fig. 5

Petition 116; Viz ¶160.

Lindström's first portion of the sidewall stiffener is bolted or riveted to the inclined transition portion, not the first region of the sidewall, as required by this claim:



EX1005 Fig. 4 (cropped, highlight added); Viz ¶161. Notably, none of the bolts or rivets mount the first portion to the first region, and neither the Petition nor Dr. Ahmadian's declaration address this issue. Viz ¶162. Thus, the identified first portion of the sidewall stiffener is not mounted to the first region of the sidewall. *Id.*

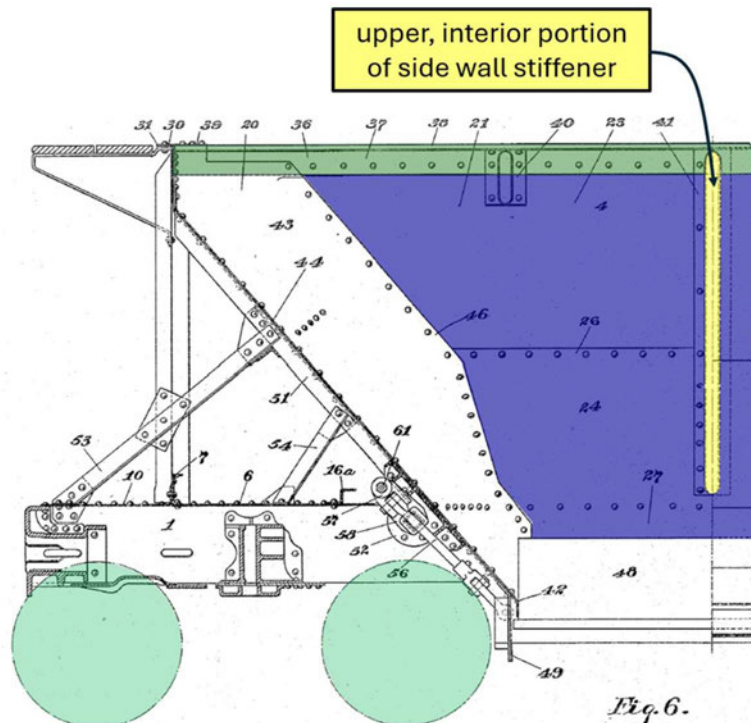
iv. Claim limitation [2s]

Limitation [2s] requires a positional relationship for the two-portion sidewall stiffener: (1) "said first portion of said first upstanding sidewall stiffener being laterally outboard of said first region of said first upstanding sidewall;" and (2) said second portion of said sidewall stiffener being laterally inboard of said second region of said first upstanding sidewall." Petition 114. Petitioner relies on its discussion of [1h] for this claim limitation, and adds no further analysis. Viz ¶166. Petitioner's argument for [1h] consists of two sentences: "[i]n the preceding illustration, 'inboard' is to the right and 'outboard' is to the left. Accordingly, Lindström discloses this limitation, as shown above." Petition 97. However, there is no preceding illustration in the discussion of the limitation. Viz ¶167.

In Ground 2b, Petitioner does not to show that, in Lindström (as combined with the 1946 Cyclopedia and Wong), the two stiffener portions satisfy these inboard/outboard placements relative to the claim-defined regions of the sidewall. Petitioner never anchors the "first" and "second" regions consistently and supplies

no engineering proof—only annotated imagery—to establish the required lateral offsets.

The preceding illustration on page 96 of the Petition, for [1g] shows the following:



Petition 96. It is unclear how “inboard” is to the right and “outboard” is to the left” in the above illustration. *Viz* ¶167. Thus, Petitioner has not shown that [2s] is met by Lindström, much less the proposed combination of the 1946 Cyclopedia in view of Lindström. *Id.* Petitioner has not met its burden to show a reasonable likelihood that this claim limitation is taught or rendered obvious by the asserted art, much less claim 2 as a whole. *Viz* ¶¶166-170.

Even accepting Petitioner's labels, the claim demands that the lower portion be laterally outboard of the first region and the upper portion be laterally inboard of the second region. Petitioner never provides a dimensioned or interface-anchored showing (*e.g.*, section views, offsets, or centerline references) demonstrating those relative lateral positions in the Lindström geometry. Dr. Viz's review makes clear that the Petition's two sentences on [1h] (incorporated into Ground 2b) do not identify a datum, do not tie "inboard/outboard" to the car's transverse plane, and do not demonstrate that the upper portion is actually inboard of the upper region (as opposed to co-planar with a transition plane). Viz ¶¶168-170.

v. Claim limitation [2u]

Limitation [2u] requires that the "sidewall stiffener [has] web continuity between [its] first and second portions." In Ground 2b, Petitioner largely incorporates its discussion of [1j] and asserts that the combined teachings of Lindström, the 1946 Cyclopedia, and Wong would render this limitation obvious. But on the trial record, Petitioner never demonstrates 'web continuity' as that term is taught by the '892 Patent and understood by a POSITA; instead, Petitioner alternates between (i) treating "web continuity" as merely being in the same vertical plane, and (ii) pointing to hat/U-shaped or L-angle attachments that have no continuous web across the first and second stiffener portions. Petition 10, 14, 32-33, 98, 116; Viz ¶¶92, 100, 132-133; *See* §VIII.A.iii, above.

Petitioner never identifies any continuous web in Lindström or the 1946 Cyclopedia; rather, it conclusorily asserts that the two portions are “in the same vertical plane,” and that is enough. Petition 32. Being co-planar is not the same as possessing a single continuous web; the latter is a structural continuity requirement, not a geometric alignment preference. Viz. ¶175.

Petitioner offers no reasoned explanation why a POSITA would re-engineer the asserted art to create a unified web spanning the two stiffener portions (and through the transition), with the side sheet serving as the flange. The proposed Wong additions are joint details for steel/aluminum interfaces (galvanic isolation, sheet joining), not disclosures of a continuous stiffener web. Wong is not about web continuity in hopper side stiffeners and does not provide a teaching or motivation to convert the disparate pieces in Lindström/1946 Cyclopedia into a continuous-web section. Viz ¶¶171-177.

vi. Claim 5

In Ground 2b, Petitioner attempts to satisfy this numeric, location-specific requirement by (i) reading dimensions from Lindström's schematic as if it were drawn to scale and (ii) asserting that, in any event, a POSITA would treat the precise positioning of the transition portion as a “design choice.”

Petitioner's method measures from non-scale drawings and thus cannot establish the claimed numeric range. As Dr. Viz explains, Petitioner treats

Lindström's figure as if it were to scale and then extracts proportional measurements to claim that the transition height falls within $\frac{1}{4}$ - $\frac{2}{3}$ L. That is not a permissible engineering or evidentiary basis to prove a numeric range: patent drawings are not to scale unless the document says so, and neither Petitioner nor its expert identifies any basis to convert Lindström's illustrative figure into dimensionally reliable evidence. Viz Decl. ¶180. Such reliance is misplaced. *See, e.g., Hockerson-Halberstadt, Inc. v. Avia Group Int'l., Inc.*, 222 F.3d 951, 956 (Fed. Cir. 2000).

Dr. Viz further notes that Petitioner's expert simply adopts dimensions "consistent with Lindström's drawings" and the 1946 Cyclopedia and labels them "a matter of design choice," rather than providing dimension-tied proof from the prior art. That is not how a POSITA would establish, nor how Petitioner can prove, the relationship required by claim 5. Viz ¶¶179-180.

Even setting the scale problem aside, Petitioner's fallback, that a POSITA would "select dimensions" to place the transition anywhere in $\frac{1}{4}$ - $\frac{2}{3}$ L, is conclusory and ignores the engineering constraints that actually fix where a transition belongs. As Dr. Viz details, hopper geometry is governed by complex parameters, and not free parameters that a designer would adjust merely to hit a litigation target fraction of L. A POSITA would not make "wholesale modifications" to legacy cars (or to Lindström's geometry) just to arrive at a particular $\frac{1}{4}$ - $\frac{2}{3}$ L ratio without an art-based reason; that is hindsight, not obviousness. Viz ¶¶178-181.

vii. Claim 6

Claim 6 requires that the hopper “includes first and second sloped side sheets; and said first sloped side sheet meets said first sidewall at said transition portion.” Petition 118. In Ground 2b, Petitioner tries to satisfy this limitation by re-defining “sloped side sheet” as the sloped region of the sidewall itself, rather than as a separate sheet element, and then mapping that very same structure to the transition portion it must “meet.” On the developed record, that approach is internally inconsistent, contrary to the claim language, and unsupported by the cited art, as discussed in detail in §VIII.A.vii *supra*.

As noted above, in §VIII.A.vii, the district court found that the term “***sloped side sheet***” means “***a sheet extending in a longitudinal direction with respect to a side of the hopper and which forms a sloped surface***” and rejected Petitioner’s argument that the “sloped side sheet” could be formed by sloped portion 98. EX2053 at 1-3.

For at the reasons cited by the District Court, a POSITA would understand that a sloped side sheet would be a separate feature from the claimed side wall. *See supra* §VIII.A.vii. Petitioner and Dr. Ahmadian’s construction of this claim was rejected by the District Court - it should also be rejected here.

Dr. Viz explains that, in Ground 2b, Petitioner abandons the separate-sheet understanding it invoked elsewhere and instead treats the sloped part of the wall as

the “sloped side sheet.” Under that view, the claimed “first sloped side sheet” and the “transition portion” become the same structure, so the sheet can never “meet” the transition as the claim requires. That is a self-referential mapping that a POSITA would not accept under the plain language of claim 6. *Viz Decl.* ¶¶182-183.

viii. Claim 8

Claim 8 requires, in addition to claim 2: (8a) “said hopper has a cross-wise extending outboard end top chord”; and (8b) “an end post extends from said draft sill to said end top chord, said end post being mounted above said draft sill between said truck center and said striker.” *See* Petition 121-122. The proposed combination of asserted art does not teach or render obvious either limitation.

(1) Petitioner’s mapping conflates the patent’s end top chord with a different structural member—its own “reinforcing beam”—and never shows a distinct end top chord (8a)

Across grounds, Petitioner alternates between labeling the same cross-wise member (visible at the outboard end) as (i) the patent’s “first cross-wise extending beam” (for reinforcement) and (ii) the patent’s “end top chord.” But the ’892 Patent distinguishes these as separate structures serving different functions (reinforcing the slope sheet vs. being the end top chord of the end wall). Petitioner provides no reasoned explanation why a POSITA would read the 1946 Cyclopedia figure(s) to make them one and the same, and its expert offers no analysis to bridge that

functional gap. Dr. Viz explains this defect and why a POSITA would not collapse the members.

Lindström does not have an end post, as the Petition admits. Petition 122-124. The Petitioner contends that modifying Lindström with the 1946 Cyclopedia cures this deficiency. *See* Petition 123. However, the Petition fails to provide any reasonable basis or rationale to explain why a POSITA would have been motivated to make the proposed modification, or any likelihood of success of the proposed modification—this is just another instance of the Petitioner improperly using the claims as a roadmap to attempt to invalidate the claims. Viz ¶189.

(2) Petitioner does not prove the end post required by 8b

Petitioner's annotated snippets never establish a continuous structural path that originates at the draft sill and terminates at the end top chord. The lower end is shown only in proximity to the sill, not from it, and the upper end is not tied to the chord (as opposed to a gusset or web below it). Dr. Viz details these missing origin/termination showings and notes that Petitioner's expert does not opine on claim 8 at all in a way that would supply this proof. Viz ¶190.

Petitioner conflates being near the sill level with being mounted above the sill; but 8b imposes a mounting requirement in addition to the from-/to-relationship. Petitioner's figures do not identify an actual mounting interface above the sill. Dr. Viz highlights this independent failure. Viz ¶ 190.

Petitioner never provides a dimensionally anchored placement tying the alleged post to the truck center and striker on the very drawing being used. The positional assertion is hand-waving and uncreditable.

Petitioner's earlier figures sometimes include the corner/end posts within the blue-outlined "sidewalls," and elsewhere treat those same verticals as distinct posts. That inconsistency infects claim-8 mapping: when the post is counted as part of the sidewall, the Petition cannot simultaneously treat it as a separate member that extends to (and mates with) the end top chord above the sill and in the specified window. Dr. Viz identifies this equivocation, which persists into Ground 2b.

ix. Claim 9

In Ground 2b, Petitioner proposes to retrofit Lindström using the 1946 Cyclopedia and Wong. On the developed record, that mapping fails for the multiple, independent reasons set forth in §VIII.B.

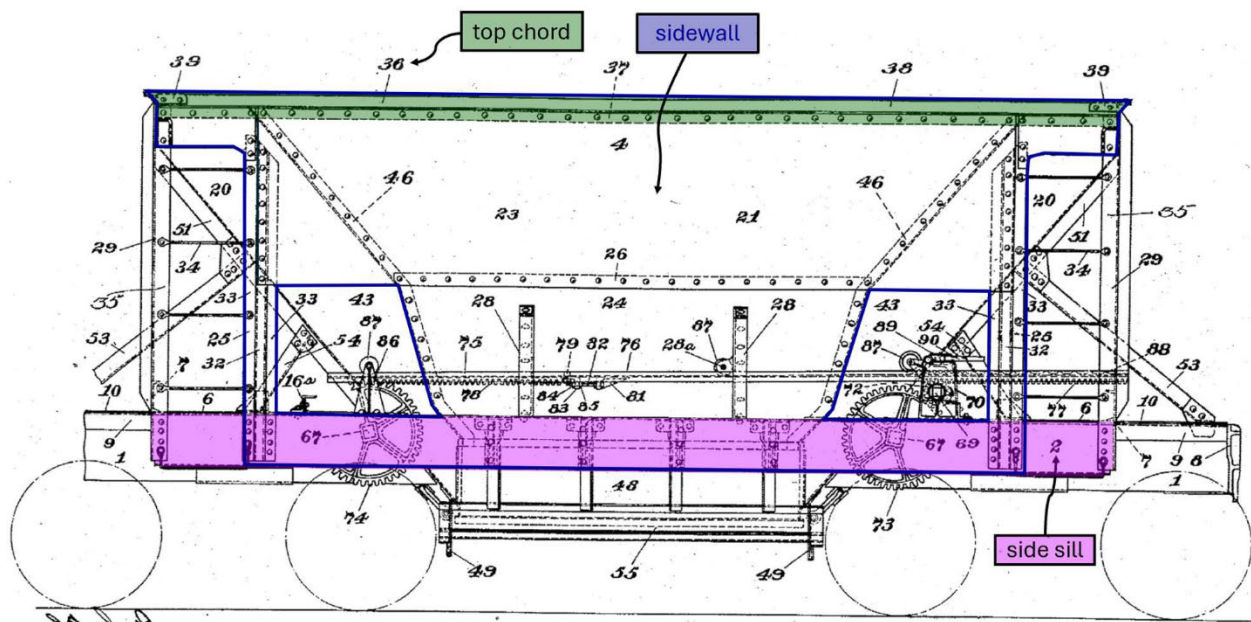
x. Claim 11

Claim 11 (which depends on claim 10) requires that the "main bolster has first and second ends; and first and second corner posts extend upwardly from said first and second ends respectively to mate with said sidewalls." In Ground 2b, Petitioner stitches together Lindström, the 1946 Cyclopedia, and Wong, and then points to annotated snippets to assert that the combined disclosure shows (i) a main bolster

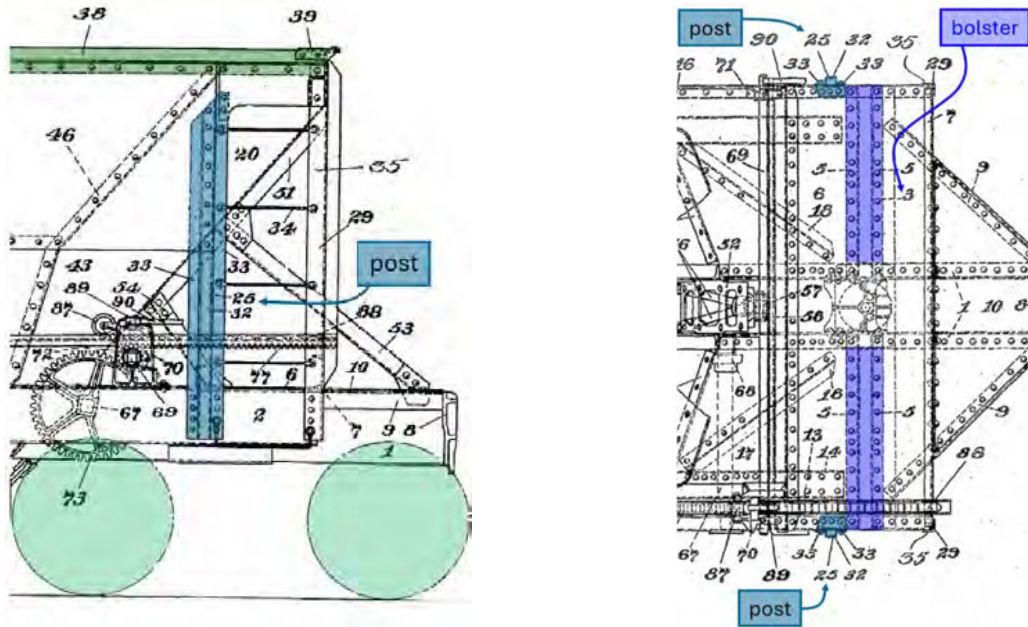
with defined ends and (ii) corner posts that extend upwardly from those ends and mate with the sidewalls. On the trial record, that showing fails for multiple, independent reasons.

As discussed in detail in §VIII.A.ix. *supra*, Petitioner has not shown that Lindström, 1946 Cyclopedia, and Wong render Claim 11 obvious: Petitioner's own figures oscillate on what counts as the sidewalls, making the "mate with said sidewalls" requirement self-contradictory and unsatisfied.

The Petition, in its discussion for Ground 2a, claim limitation 1d, asserts that the claimed "sidewalls" are shown by the annotated structures in the below figure.



See Petition 90. These annotated structures include the two posts towards the sides of the rail car:



Petition 128-129; EX1003 ¶88.

If the structures identified by the Petition for the “sidewall” are interpreted to have the corner posts be a part of the “sidewall”, then the asserted art cannot reasonably be construed to satisfy the language of claim 11. That is, it would be impossible for the corner posts that are part of the “sidewall” to “extend upwardly from said first and second ends respectively to mate with said sidewalls.” Viz ¶196.

Thus, under the Petitioner’s proposed interpretation of the “sidewall” in the annotated figures above, the asserted art does not teach or render obvious claim 11. Moreover, because the Petition has provided conflicting interpretations of the asserted art with respect to the claimed “sidewall,” as discussed in §VIII.A.ix, it is unclear how, or why, the proposed combination of asserted art would result in the invention of claims 2, 8, or 10 (on which claim 11 depends), much less claim 11.

xi. Claim 12

Dependent claim 12 includes the same additional limitations as dependent claim 11 but depends directly on claim 2 instead of claim 10, which also depends on claim 2 indirectly through claim 8. *Viz* ¶198. Thus, Petitioner's Ground 2b mapping fails for the same reasons it fails for claim 11, and the different dependency path does not cure the evidentiary gaps. *Id.*

xii. The Petition has not met its burden with respect to Ground 2b

The Petition does not establish unpatentability of any of claims 2-14 on Ground 2b.

E. Ground 2c

Ground 2c asserts that claim 15 would have been obvious over Lindström in view of the 1946 Cyclopedia, Wong, and Coates. Claim 15 requires the first and second portions of the sidewall stiffener are (i) “made of flat bar,” (ii) “positioned in vertical-transverse planes,” (iii) “substantially co-planar,” and (iv) “substantially vertically aligned in a sectional view looking along the car.”

As discussed in detail in §VIII.C.i *supra*, Petitioner has not met its burden to show claim 15 unpatentable over Lindström, 1946 Cyclopedia, Wong, and Coates; Petitioner fails to establish that claim 2 is obvious; Petitioner offers no *KSR*-compliant rationale (or engineering analysis) to substitute “flat bar” into the

Lindström/1946 Cyclopedia/Wong assembly while preserving the other stiffener relationships; Petitioner provides no material-identified or dimensioned proof of “flat bar”; its reliance on annotated imagery and inference is inadequate; PO’s expert identifies these gaps; and Petitioner’s expert did no CAD/FEA or material verification to bridge them. Viz ¶199-200.

F. Objective Indicia of Non-Obviousness

Secondary considerations support a finding of nonobviousness. “Objective indicia of nonobviousness must be considered in every case where present.” *Apple Inc. v. Samsung Elecs. Co.*, 839 F.3d 1034, 1048 (Fed. Cir. 2016). Evidence of such indicia “may often be the most probative and cogent evidence in the record.” and can “guard against slipping into use of hindsight,” which is especially true here *Id.* (citation omitted).

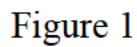
PO’s claimed inventions are embodied by its commercial embodiment, which is a commercial success. Petitioner copied that commercial embodiment (and the claimed inventions) after another competitor failed in replicating the success of PO’s inventions and product. And the common customer for these specialty railcars specifically requested patented features.

i. PO's Commercial Embodiment Practices the Claims

PO's commercial embodiment practices the claims. PO sold 232 railcars for use on the DMIR in 2009 that practice the claimed invention:



EX2004 at 4.



ii. ARI Failed to Replicate the Success of PO's Product

After taking delivery of PO's railcars for use on the DMIR in 2009, CN sought additional bids for the same type of specialty railcar in or around 2012. ARI was awarded the contract and provided railcars that lacked many of the inventive features of PO's railcars. For example, ARI's railcars lacked the claimed open end section of independent claim 2 of the '892 Patent, which used "cross-wise beams" to support the slope sheet. Instead, ARI's design used a large, vertical wall to provide such support.



EX2004 at 21.

After receiving the ARI railcars, CN noted the lack of easy access for maintenance personnel because of ARI's large, vertical wall. EX2048.

iii. Petitioner Copied PO's Commercial Embodiment and Claimed Invention

By 2019, CN sought to add additional railcars to its roster. CN specifically requested the open-end sections of NSC's patented railcars during the bidding process. EX2048. [REDACTED]

[REDACTED]. EX2033, 4-6; EX2007 at ¶¶64-67; EX2004 at ¶¶64-67. [REDACTED]

[REDACTED]

[REDACTED] EX2033, 4-6; EX2007 at ¶¶64-67; EX2004 at ¶¶64-67. What resulted is a near-identical copy of the NSC railcar:





EX2004 at 9-10.

PO sued Petitioner for its willful patent infringement. EX2004. Petitioner's railcars infringe the claimed inventions. EX2004 ¶¶135-145, 156-167.

As explained in PO's Discretionary Denial Brief (Paper 8 at 5-13), Petitioner knew of the '892 Patent approximately two years after it issued (EX2012 at ¶[0005]), cited the '515 Patent (which has a common specification and claims priority to the '892 Patent) in its own patent applications (*Id.*; *see also* Exs. 2013 ¶[0006]; 2014 at 1:30-41; 2017 at 1:36-46; 2015; 2016; 2018; 2019; 2020 ¶[0071]; 2021 ¶[0074]; 2022 ¶[0073]), [REDACTED] (EX2004 at ¶26, EX2007 at ¶¶68-69), [REDACTED] [REDACTED] (EX2004 at ¶¶59-71), and has been involved in multiple patent

lawsuits with PO Exs. 2024, 2025, 2026, 2005; IPR2016-00787; IPR2016-00788; EX2026 ¶21. And notably, in the pending District Court Litigation, the Court has already found that Petitioner likely knew of the '515 Patent prior to the lawsuit. Exs. 2005; 2006.

iv. PO's Commercial Embodiment Received Industry Praise

PO's commercial embodiments received industry praise because of its open end-section design. This praise and recognition has a nexus to the product's use of the patented technology because the claims specify how to create the open end-section through the use of various structural features. PO advertised its use of the open end-sections and CN – the only company to order these types of specialized railcars – has specifically asked for open end-sections in subsequent orders, including those awarded to Petitioner. EX2048.

v. Further Evidence of Objective Indicia of Non-Obvious Exists

Petitioner is aware of other evidence of objective indicia of non-obviousness, but refused PO's request to use such evidence in this filing. PO reserves the right to submit additional evidence. Thus, the objective indicia of non-obviousness support a finding of patentability.

IX. Conclusion

For the foregoing reasons, the claims of the '892 Patent should be found patentable.

Respectfully Submitted,

Date: March 13, 2026

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CERTIFICATION UNDER 37 C.F.R. § 42.24(d)

I hereby certify that the foregoing complies with the type-volume limitation of 37 C.F.R. § 42.24 and contains 13,798 words based on the word count indicated by the word-processing system used to prepare the paper, excluding the table of contents, table of authorities, exhibit list, certificate of service, certificate of word count, and signature block.

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CORRECTED CERTIFICATE OF SERVICE

The undersigned hereby certifies that the foregoing **PATENT OWNER'S RESPONSE** was served electronically in its entirety on March 13, 2026 via electronic mail to the following attorneys of record:

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