

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 IPR2025-01047

Patent No. 8,132,515

PATENT OWNER'S PRELIMINARY RESPONSE

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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
2018	Inventor's Declaration from file history of U.S. Patent No. 10,710,612
2019	Information Disclosure Statement Dated October 1, 2018 from File History for the Application that Issued as U.S. Patent No. 10,710,612
2020	U.S. Provisional Application No. 62/650,472
2021	WIPO Publication No. WO2019/191762
2022	U.S. Patent Publication No. 2021/0009,169 (U.S. App. No. 17/038,205)

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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

I. INTRODUCTION

In response to FreightCar America, Inc.'s ("Petitioner") copying of patent owner National Steel Car Limited's ("Patent Owner") railroad hopper car, Patent Owner sued Petitioner for infringement of two patents, including U.S. Patent No. 8,132,515 ("the '515 patent"). The petition for *inter partes* review (the "Petition") of claims 1-44 (the "challenged claims") of the '515 Patent attempts to create inefficiency with a cumulative, parallel Patent Trial and Appeal Board ("PTAB" or "Board") proceeding that trails a district court action but fails to provide basis, or articulate rationale supported by evidence and logic, sufficient for trial under the standards of *inter partes* review.

Petitioner's challenge to the '515 Patent claims is fundamentally deficient. At the outset, Petitioner fails to address each and every limitation of any challenged claim, let alone provide a coherent analysis of any claim as a whole. These failures alone render the Petition legally insufficient under the standards of *inter partes* review.

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Moreover, Petitioner does not offer a credible motivation to combine the asserted art references¹ in a manner that would lead to the claimed invention of any challenged claim. The Petition lacks any articulated rationale supported by evidence or logic that would compel a person of ordinary skill in the art at the relevant time (“POSITA”) to make any of the proposed combinations of asserted art references. Without such a motivation, the asserted obviousness grounds collapse.

The report of Petitioner’s expert Dr. Ahmadian does not remedy the Petition’s deficiencies. The report fails to address each and every limitation of any challenged claim and it improperly reaches the ultimate conclusion of obviousness. Moreover, Dr. Ahmadian’s report is a near verbatim reproduction of the Petition, rendering his analysis unhelpful to the Board.

Further, the Petition and Dr. Ahmadian’s report amend the exhibits of the asserted art to add details that are not present from the low-resolution images provided in the exhibits. In this way, the Petition and Dr. Ahmadian substitute what they would like the asserted art to show for what is actually shown in the exhibits of the asserted art.

¹ As explained in Patent Owner’s Discretionary Denial Brief (Paper 7 [redacted], 8 [under seal]), Petitioner’s asserted art is cumulative to what has already been considered by the Office during prosecution of the ’515 Patent.

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In sum, the Petition is not only procedurally inadequate but also substantively unsupported. The Board should decline to institute trial, as the Petition fails to establish a reasonable likelihood that any challenged claim is unpatentable.

II. FACTUAL BACKGROUND

Patent Owner has earned a reputation as North America's leading railroad freight car manufacturer. For over a century, when its first wood and steel freight cars left the production line, Patent Owner has been designing and making a wide range of freight cars tailored to meet the evolving needs of the rail transportation industry. Its freight cars include open-top railroad hopper cars for transporting material such as iron ore. The railroad hopper cars are designed so that material such as iron ore can be deposited into the top of each car. The deposited material sits on a mechanically-driven floor that opens in order to gravity-feed the material into a ship loader or other conveyance system positioned below the rail car.

Patent Owner designed, built, and sold hundreds of such open-top hopper with bottom discharge rail cars (colloquially referred to as "jennies") to Canadian National Railway Company ("CN") for use on its Duluth, Missabe and Iron Range Railway ("DMIR") subsidiary in or around 2009. Unique requirements of docks on which the jennies would be used by DMIR in Two Harbors, Minnesota led Patent Owner to innovate novel features for the rail cars, covered by the challenged claims.

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Images of one of the jennies as manufactured by Patent Owner and used by DMIR are shown below:



Patent Owner filed for the '515 Patent to cover innovations it made in the design and construction of the above jenny.

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The '515 Patent identifies several design constraints stemming from the requirements of the railways and docks on the DMIR, rendering prior art designs unsuitable and leading to the distinctive design of the Patent Owner's patented rail cars. For example, the patent discusses maximizing the hopper and lading volume, while designing the car within limited dimensional profiles. '515 Patent (Ex.1001), 1:47-2:18. The claimed arrangements in the challenged claims were developed to address the limitations presented by the abnormally short dimensions required for the rail car.

In April 2024 Petitioner announced that it sold 600 new 1,150 cubic foot iron ore hopper cars that were built at its Mexican manufacturing facility to CN for use by DMIR. EX2004, ¶39. Images of one of these cars is shown below:





EX2004, ¶50. Patent Owner initiated litigation against Petitioner in the U.S. District Court for the District of Delaware on May 17, 2024, for infringement of the '515 Patent. EX2003.

III. OVERVIEW OF THE '515 PATENT

The Petition misreads the '515 Patent and ignores its claim language. Claim 1 is reproduced below with emphasis added and with Petitioner's annotations "1a"- "1i":

1. [1a] A railroad hopper car for carrying particulate material, said hopper car comprising:
a hopper;
first and second end sections for carriage by
respective first and second rail road car trucks for
rolling motion along railroad tracks in a
longitudinal direction;

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said hopper being suspended between said first and second end sections,

[1b] said hopper having a discharge section through which to release lading, and first and second end slope sheets oriented toward said first and second end sections, said end slope sheets being inclined in the longitudinal direction to feed said discharge section;

[1c] said first end section including a draft sill extending in the longitudinal direction, a main bolster extending cross-wise to said draft sill, and a shear plate mounted to said draft sill and to said main bolster, said shear plate extending lengthwise along said draft sill and cross-wise from side to side of said hopper car;

[1d] said first end slope sheet of said hopper overhanging said shear plate of said first end section; and

[1e] *said hopper car being free of primary structure directly above said shear plate of said first end section under said overhang of said first end slope sheet of said hopper;*

[1f] *one of:*

(a) said first end slope sheet has an upper margin and said hopper car includes an end post extending upwardly from said draft sill to said upper margin of said first end slope sheet; and

(b) said first end slope sheet has an upper margin terminating at an end wall, and said hopper car includes an end post extending upwardly from draft stub sill to said end wall;

[1g] said shear plate has a longitudinally outboard margin and said draft sill has a striker located outboard of said longitudinally outboard margin of said shear plate, and said end post is one of:

(a) rooted to said draft sill adjacent to said striker;

(b) rooted to said shear plate adjacent to said longitudinally outboard margin of said shear plate;

[1h] said bolster has first and second laterally outboard distal ends, and said hopper car has corner posts extending upwardly from said distal ends of said bolster to said first end slope sheet; and

[1i] said hopper car has a machinery space bounded by (a) said first end slope sheet; (b) said shear plate of said first end section; (c) said end post; and (d) said corner posts, and said machinery space is free of any other primary structure.

Petition, 1-2; '515 Patent, 23:8-56.

Independent claims 7, 18, 20, 24, and 32 contain similar limitations. Petition, 3-5, 6-8, 9-10, 11-12, and 14-15, respectively; '515 Patent, 24:24-25:5, 25:55-26:45,

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26:59-27:41, 27:59-28:46, and 29:19-30:13, respectively. The remaining claims are dependent claims, each depending, directly or through one or more intervening claims, on one of the independent claims.

As discussed below, the Petition's analysis systematically ignores the actual language of the claims, including many of the limitations discussed above.

IV. LEVEL OF ORDINARY SKILL IN THE ART

Petitioner contends 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." Petition at 29. Petitioner's proposed POSITA is incorrect because a person having only designed "similar vehicles" to rail cars would not necessarily be applicable to the art of the '515 Patent. *See* Declaration of Mark J. Viz Ph.D., P.E. (EX2035, hereinafter "Dr. Viz"), ¶¶33-40.

A POSITA in the field of the '515 Patent would have 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. Dr. Viz, ¶35.

Although Dr. Ahmadian's background includes academic research in multi-body railcar truck dynamics, which is relevant to the dynamic performance of a railcar, Dr. Ahmadian's background does not include actual industry experience with

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railcar structures. Dr. Viz, ¶40. As a result, Dr. Ahmadian makes the wrong conclusions and conflates various concepts that a POSITA with practical industry experience and knowledge of rail cars would not. *Id.*

V. CLAIM CONSTRUCTION

A petitioner must observe the basic statutory and regulatory content requirements of a petition in showing with particularity that their grounds meet the challenged claims as they construe them. *See, e.g.*, 35 U.S.C. §322(a)(3) (requiring “particularity”); 37 C.F.R. §42.204(b)(3)-(4). Petitioner’s failure to comply with these statutory and regulatory requirements provides sufficient reason on its own to deny the Petition.

The Petition claims it does not advance any claim constructions. *See* Petition at 29. However, as explained below, the Petition takes numerous stances on claim construction and what claim terms should mean, sometimes leading to inconsistent positions. Instead of evaluating the claim language, specification, and prosecution history as required by law to construe the claims, Petitioner merely cites to the asserted art or other extrinsic documents. Instead of evaluating the claim language, specification, and prosecution history as required by law to construe the claims, however, Petitioner merely cites to the asserted art or other extrinsic documents. *See Phillips v. AWH Corp.*, 415 F.3d 1303 (Fed. Cir. 2005) (*en banc*) (intrinsic evidence must be considered for claim construction). Petitioner’s failure to justify the

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proposed constructions and to show with particularity that the grounds meet the challenged claims as Petitioner construes them as required by statute and regulation (35 U.S.C. §322(a)(3); 37 C.F.R. §42.204(b)(3)-(4)) warrants denial of institution.

For this preliminary response, no construction of the challenged claims, other than the “ordinary and customary meaning” as understood by a POSITA in view of the '515 Patent specification and prosecution history, is required to deny institution. *See Phillips v. AWH Corp.*, at 1312-13; 37 C.F.R. §42.100(b).

VI. THE PETITION FAILS TO ESTABLISH A REASONABLE LIKELIHOOD THAT IT WILL PREVAIL ON ANY CHALLENGED CLAIM

The Petition asserts nine (9) grounds of unpatentability (Petition at 19), none of which establish a reasonable likelihood that Petitioner will prevail on any challenged claim.

A. Legal Standard

A patent claim is unpatentable under 35 U.S.C. §103(a) if the differences between the claimed subject matter and the prior art are “such that the subject matter, as a whole, would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains.” *KSR Int'l Co. v. Teleflex Inc.*, 550 U.S. 398, 406 (2007). The question of obviousness is resolved on the basis of underlying factual determinations, including: (1) the scope and

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content of the prior art; (2) any differences between the claimed subject matter and the prior art; (3) the level of skill in the art; and (4) objective evidence of nonobviousness, *i.e.*, secondary considerations. Thus, the obviousness inquiry is based on factual inquiries including the differences between the claimed invention and the prior art. *Id.*

To establish obviousness of a claimed invention, all the claim limitations must be taught or suggested by the prior art and there must be a motivation to combine such features in the prior art to arrive at the claimed invention. *See CFMT, Inc. v. Yieldup Int'l Corp.*, 349 F.3d 1333, 1342 (Fed. Cir. 2003). The fact that prior art references deal with the same subject matter is not in itself sufficient rationale for combining them to reach the claimed invention. In order to combine prior art references, some suggestion, motivation, or reasonable basis must exist, either in the references themselves or in the knowledge generally available to one of ordinary skill in the art, to modify or combine the teachings in the references. *See, e.g., KSR*, 550 U.S. at 418-19. Indeed, Petitioner must credibly explain why a person of ordinary skill in the art would have been prompted to combine particular available elements of knowledge, as evidenced by prior art, to reach the claimed invention. *Id.; In re Kahn*, 441 F.3d 977, 988 (Fed. Cir. 2006) (“[O]bviousness grounds cannot be sustained by mere conclusory statements; instead, there must be some articulated reasoning with some rational underpinning to support the legal conclusion of

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obviousness.”); *see Mintz v. Dietz & Watson, Inc.*, 679 F.3d 1372, 1379 (Fed. Cir. 2012) (“Obviousness requires a court to walk a tightrope blindfolded (to avoid hindsight) – an enterprise best pursued with the safety net of objective evidence.”).

As explained below, Petitioner has failed to make these required showings. In particular, the Petition’s overarching shortcoming is that it lacks an “articulated reason[] with some rational underpinning to support the legal conclusion of obviousness.” *In re Kahn*, 441 F.3d at 988. The Petition fails to address the apparent differences between the references and the challenged claims, how one of ordinary skill in the art would go about combining their disparate elements, or what modifications one of ordinary skill in the art would necessarily have made in order to combine the disparate elements. The inadequacy of the obviousness analysis in the Petition and the accompanying declaration is readily apparent when the disparate elements of the references are scrutinized closely, and the Board should decline any invitation by Petitioner to search through the record to try and piece together teachings that might support Petitioner’s positions.

B. Dr. Ahmadian’s Failure to Consider All Claim Limitations in Any Challenged Claim Renders His Assessment and Opinions Speculative and Insufficiently Substantiated

Dr. Ahmadian reaches an ultimate conclusion that the challenged claims are obvious. Declaration of Mehdi Ahmadian (EX1003, hereinafter “Ahmadian Decl.”), ¶155. However, in evaluating the challenged claims he fails to consider each and

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every element as set forth in any challenged claim. *See Verdegaal Bros. v. Union Oil Co. of California*, 814 F.2d 628, 631 (Fed. Cir. 1987) (“A claim is anticipated only if each and every element as set forth in the claim is found, either expressly or inherently described, in a single prior art reference.”). Dr. Ahmadian also fails to consider the differences between the asserted art and any challenged claim as a whole—the question for any obviousness assessment is not whether the differences between the asserted art and the claims would have been obvious, but whether the claimed invention **as a whole** would have been obvious. 35 U.S.C. § 103; *see also Stratoflex, Inc. v. Aeroquip Corp.*, 713 F.2d 1530 (Fed. Cir. 1983).

For instance, Dr. Ahmadian's report discusses claim limitations [1a], [1c], and [1e]-[1i] with respect to Ground 1a, but **ignores limitations [1b] and [1d], as well as claim 1 as a whole**. EX1003, 31-52. Dr. Ahmadian's report is similarly deficient with respect to the other independent claims and the dependent claims.

Having improperly limited his analysis of the asserted art to only a few claim limitations, Dr. Ahmadian failed to consider the impact of those claim limitations on, as well as the interaction with, other limitations in each challenged claim, or the invention as a whole of any challenged claim. Therefore, Dr. Ahmadian's opinions regarding the proposed combinations of asserted art references with respect to any challenged claim are deficient and unhelpful.

Accordingly, Dr. Ahmadian's opinions should not be given any weight.

C. Ground 1

Petitioner asserts that claims 1 and 2 are obvious over Hart (EX1008) and the 1906 Cyclopedia (EX1009). Petition, 32. As set forth below, the Petition fails to establish a reasonable likelihood that Hart and the 1906 Cyclopedia render claims 1 and 2 obvious.

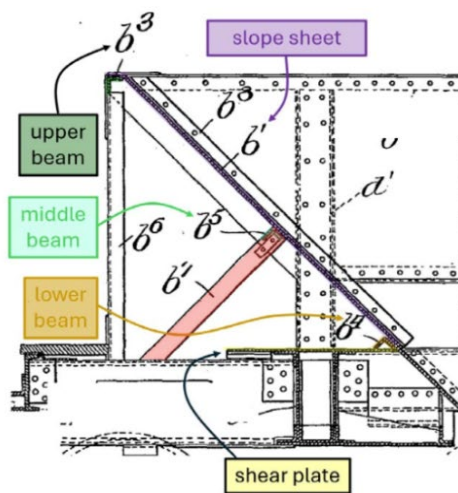
i. Claim Limitation 1e

Limitation 1e requires:

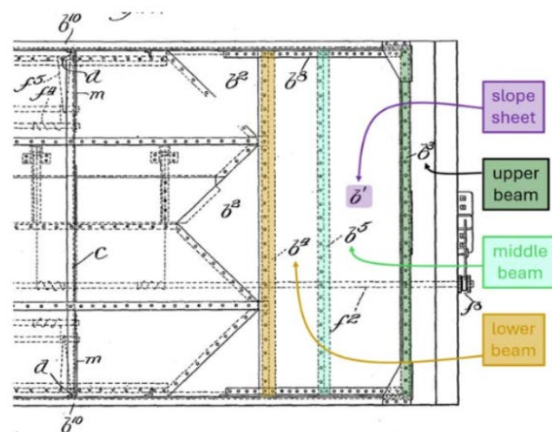
said hopper car being free of primary structure directly above said shear plate of said first end section under said overhang of said first end slope sheet of said hopper.

Petition, 36. The asserted art does not teach or render obvious a lack of primary structure “above said shear plate of said first end section under said overhang of said first end slope sheet of said hopper.” Dr. Viz, ¶56.

Petitioner provides annotated images of Hart:



Side View



Plan View

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Petition, 38; Ahmadian Decl., ¶¶68-69; Dr. Viz, ¶57 (annotated to emphasize diagonal strut b^7 in red). Based on these images, Petitioner concludes “Hart’s slope sheet is not supported by elephant ears (e.g., large triangular, longitudinal plates), struts, transverse plates, or any other primary structure directly above the shear plate and below the slope sheet,” and further identifies three structures at the end of the rail car: “(corner) post b^6 , (side) post d' , and inclined brace b^7 .” Petition, 39. Inclined brace (*i.e.*, diagonal strut) b^7 is highlighted in red in the annotated figure shown above. Dr. Viz, ¶¶57-58.

The Petition states that

[i]nclined brace b^7 is mounted to the side sill and extends upwards in a vertical plane, without extending laterally inward into the machinery space or above the shear plate. If inclined brace b^7 extended laterally inward, it would be visible in Fig. 2, an upper plan view of the hopper car. But it is not.

Petition, 40 (internal citations omitted). However, Petitioner’s conclusion regarding the visibility of diagonal strut b^7 lacks adequate basis as the “upper plan view” does not show any significant structural details (in dashed line) that would be below the end slope sheet in this rendering. Dr. Viz, ¶59. Therefore, Petitioner’s conclusion is without basis or merit. *Id.*

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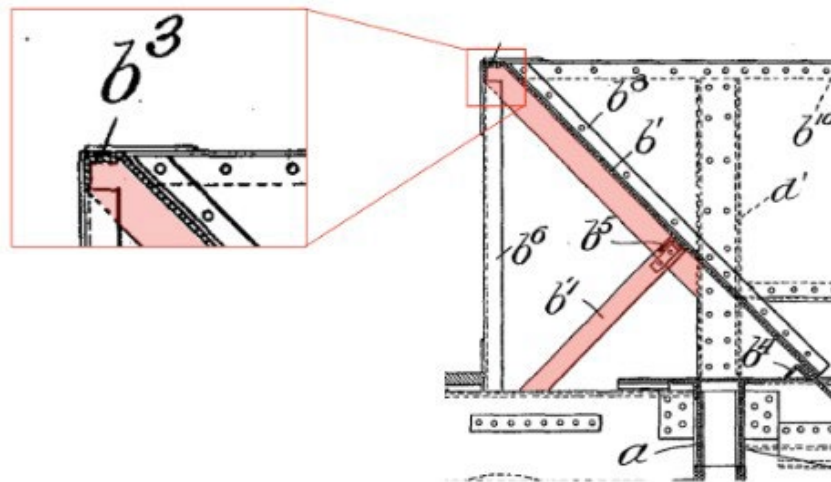
As Petitioner admits, annotated Figure 2 of Hart is a plan view looking downward onto the end slope sheet which would not show any structure underneath the slope sheet unless specifically called out with hidden lines (such as is the case for elements b^3 , b^4 , and b^5 in Hart's Figure 2, which appropriately are shown using dashed lines, as is the convention for hidden details). Dr. Viz, ¶60; *see* Petition, 38-40. It is not the case that inclined brace b^7 would necessarily be visible in Hart's Figure 2 if it was disposed laterally inward into the machinery space (such as, for example, disposed in the center so as to most effectively support the slope sheet). Dr. Viz, ¶60. Other details are also missing that one would expect in this plan view, such as the cross-section of the d' side post. *Id.*

Indeed, Petitioner does not address why, if Hart's Figure 2 must show inclined brace b^7 , the brace is not shown in Figure 2 mounted to the side sill and extending only upwards (not laterally inwards) as suggested by Petitioner. Dr. Viz, ¶61. Nor does Petitioner address why the corner post b^6 is also not shown in Hart's Figure 2. *Id.* Petitioner's analysis does not demonstrate that it is more likely than not that the inclined brace b^7 is not disposed laterally inward, as opposed to other possibilities such as, most simply, the brace b^7 is not visible at all in Hart's Figure 2. *Id.*

Furthermore, even with Petitioner's interpretation that the inclined brace b^7 is coupled to the side sill, Figure 1 from Hart still shows that there is "primary structure within the machinery space," as this term is understood in view of the '515 Patent.

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Dr. Viz, ¶62. Referring to annotated Hart Figure 1 (enlarged partial view reproduced below), Petitioner identifies the corner post b^6 as being “longitudinally outboard of the shear plate” (Petition, 39) at the corner of the railcar (Dr. Ahmadian, ¶70). Dr. Viz, ¶62. However, it can also be seen that inclined brace b^7 is coupled to a beam running diagonally along the surface of the end slope sheet (red highlights in annotated partial view of Hart Figure 1) and this beam is disposed laterally inward from the corner post b^6 , as shown in hidden lines in the upper left corner of annotated Hart Figure 1. *Id.*



Hart Fig. 1 (cropped and annotated). Dr. Viz, ¶62.

As defined by the '515 Patent, 9:24-28, the “machinery space” is “bounded by (a) the first slope sheet; (b) the shear plate of the first end section; (c) the end post; and (d) the corner posts.” This means, with respect to Hart, that the beam running diagonally along the edge of the end slope sheet (as well as possibly the inclined brace b^7) is inboard from the corner post b^6 and thus would be primary

structure within the shear plate and below the end slope sheet, which is explicitly excluded in claim 1 of the '515 Patent. Dr. Viz, ¶63.

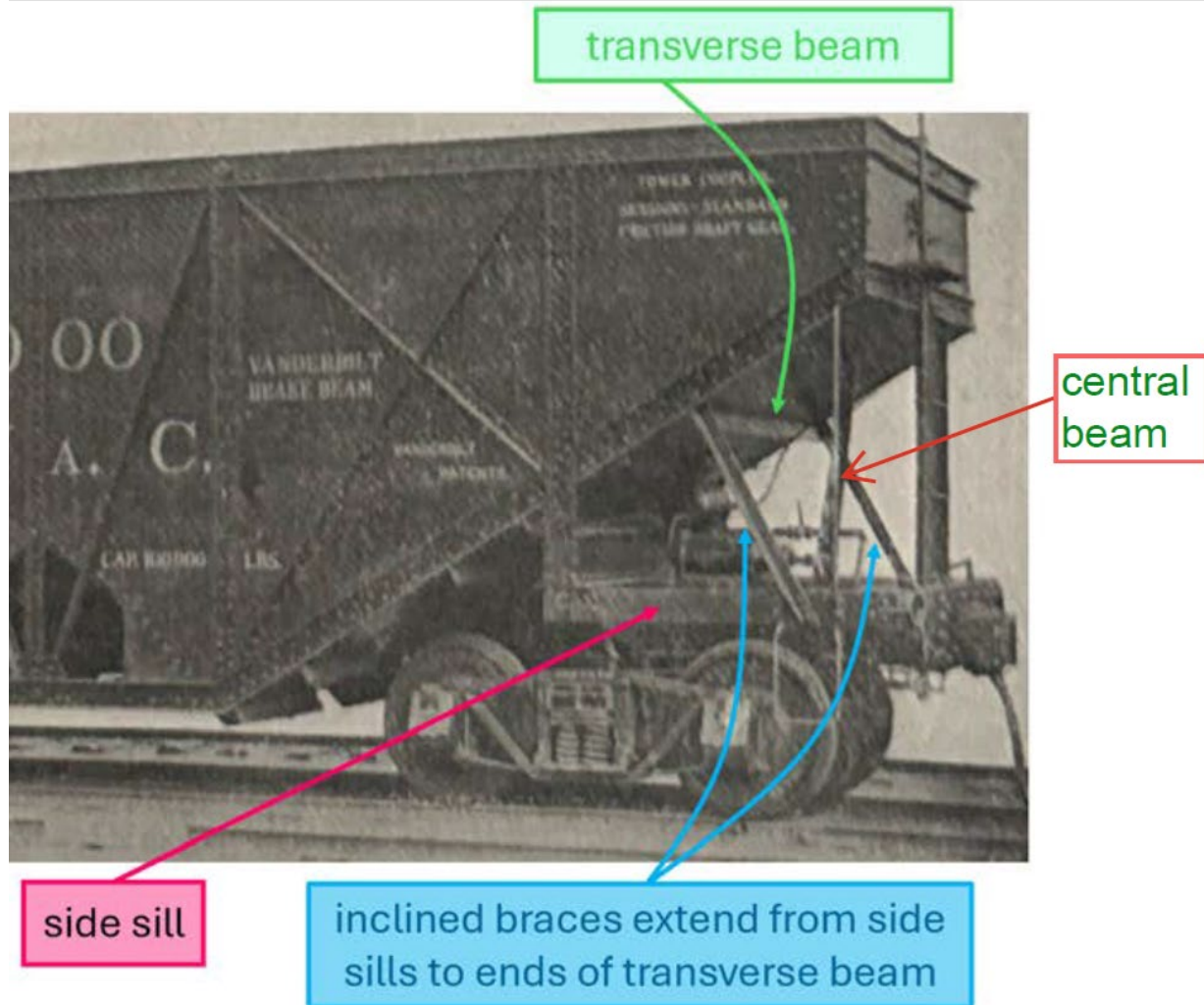
It should be noted that any interpretation of how various components are positioned in Hart requires reliance on Hart's use of hidden lines. This in turn requires that Hart use of hidden lines comports with how a POSITA would understand the meanings of these lines. Dr. Viz, ¶64. Since it is unclear whether Hart's use of hidden lines comports with what a POSITA would understand those hidden lines to represent, at a minimum, Hart's disclosure, including the figures discussed above, includes ambiguities regarding the placement of structures within Hart that renders any interpretation of thereof unreliable. *Id.* Similarly, Dr. Ahmadian does not address these ambiguities in his analysis, and therefore his conclusions cannot be relied upon. *Id.*

The Petition recognizes the ambiguities surrounding the brace b^7 in Hart, as it relies on the "Cambria Steel car" to show "inclined braces such as brace b^7 were often used to support the ends of a transverse beam." Dr. Viz, ¶66; Petition, 40-41. However, the Petition's reliance on the "Cambria Steel car" ignores the pair of crisscrossing central beams in the machine space of the same car, as seen in the enlarged partial view of the annotated illustration below. Dr. Viz, ¶66. As understood from the annotated illustration below, positioning the braces b^7 in Hart as Petitioner suggests would necessitate additional support structure in the machinery space,

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thereby teaching against Petitioner's proposed interpretation of what Hart teaches.

Id.



Id.

Dr. Ahmadian's claims in ¶73 of his Declaration are nonsensical from an engineering perspective. Dr. Viz, ¶66. Assuming that diagonal braces b^7 are at the lateral outboard locations as assumed by Dr. Ahmadian, no POSITA would tie those into the slope sheet as suggested by Petitioner, thereby leaving such a short ligament

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between that connection and where the vertical side posts d' are located. *Id.* Not only would the suggested modification not have been obvious, but from an engineering standpoint the suggested modification would have placed the diagonal struts b^7 directly in the middle of the machinery space in Hart. *Id.*

The Petition states that “[e]ven if Hart did not disclose that its inclined brace is laterally outboard of the shear plate, it would have been obvious to mount the brace to the outside of the side sill, as [in “the Cambria Steel car” shown] in the 1906 Cyclopedia, so that it would not be directly above the shear plate or in the machinery space.” *See* Petition, 41. Petitioner does not provide any reason for making such a change to Hart and cannot because a POSITA would understand that positioning the braces as Petitioner suggests would require additional supporting members such as the crisscrossing central beams shown in the annotated photo above. Dr. Viz, ¶67.

Dr. Ahmadian’s statement is incorrect that “separating the braces as far apart as possibly offers the most resistance to warping and torsional distortion.” Ahmadian Decl., ¶75. On the contrary, by doing so the braces offer the least resistance to bending of beam b^5 , which will be under a significant bending load when the car is loaded with commodity. Dr. Viz, ¶67. Dr. Ahmadian’s analysis is overly simplistic and incorrect in ascertaining the position of brace b^7 in Hart. *Id.*

Petitioner has not shown a reasonable likelihood that this claim limitation is taught or rendered obvious by the asserted art. *See* Dr. Viz, ¶¶55-68.

ii. Claim Limitation 1f

Limitation 1f requires, in part:

(b) said first end slope sheet has an upper margin terminating at an end wall, and said hopper car includes an end post extending upwardly from draft stub sill to said end wall.

Petition, 41. Recognizing Hart does not teach or suggest this limitation, Petitioner relies on the 1906 Cyclopedia's Cambria Steel car (EX1009, Fig. 53) for portion (b) of the limitation. *See id.*, 41-42; *see also* Dr. Viz, ¶69.

The Petition contends, albeit incorrectly, that a POSITA would combine the Cambria Steel car with Hart. Petition, 41-45; Ahmadian Decl., ¶¶76-81; Dr. Viz, ¶69. The Petition is incorrect because the "end post" on the Cambria Steel car terminates at the end wall, not to and including the end wall shown in the '515 Patent. *Id.* at 70. This is an important difference that a POSITA in the relevant time frame would understand and appreciate because the end post in the '515 Patent contributes to the overall "box beam" that the entire car structure affords, with the end post adding significant stiffness to the entire car body precisely because it is tied into the end wall and end top chord. Dr. Viz, ¶70.

The Petition contends that Hart could be modified by increasing the overall height of the hopper. Petition, 42. However, rail cars are based on standard sizes or profiles and AAR-limiting clearance plates, which they cannot exceed. Dr. Viz, ¶71.

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Rail cars are also specifically designed with their geometries, load capacities, and intended commodity in mind. Dr. Viz, ¶71. A POSITA would not, on a whim and without more, simply increase the height of a hopper car like Hart. Dr. Viz, ¶71. This could leave an ore car ineffectual for its intended purpose, for example, because it would not be able to carry a full load due to the increased weight of the car caused by making it taller. Dr. Viz, ¶71.

The Petition also contends that Hart could be modified “by reducing the inclination of the slope sheets so that their outboard ends terminate at a lower height (i.e., lower along the end wall).” Ahmadian Decl., ¶77; Petition, 42. However, lowering the slope sheet as suggested in the Petition would change load distribution, potentially necessitating changes to other structures in the rail car. Dr. Viz, ¶72. Moreover, it may lower the effectiveness of the rail car when dumping its load because the lower angle may not be sufficient to gravity discharge all its contents. Dr. Viz, ¶72.

Contrary to the assertions made by Dr. Ahmadian and in the Petition, a POSITA would not have found it obvious to modify Hart to add an end wall supported by an end post, as in the Cambria Steel car. *Id.*, ¶73. A POSITA would have recognized that adding only the end post would not be sufficient without also using engineering methods to evaluate whether adding the crisscrossing central beams of the Cambria Steel car or other structural members in the machine space

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would have been necessary. *Id.* A POSITA would understand from studying the Cambria Steel car that such analyses would need to be performed and that making the changes without performing such analyses is simply guesswork—this is not how a POSITA would approach this issue. *Id.*, ¶74.

In ¶74 of his declaration, Dr. Ahmadian reproduces illustrations of Figures 50 and 52-65 from the 1906 Cyclopedia, but in each instance ignores the fact that each of the illustrated cars includes additional support structures in the machine space, thereby teaching against incorporating only the end post to support the end wall. A POSITA would understand that each of the illustrated cars requires additional support structures in the machine space to support the end wall.

For at least these reasons, the proposed combination would not be “one of a finite number of well-understood options” or a “routine design choice.” *See* Petition, 45; Dr. Viz, ¶76. Instead, the proposed combination is evidence of Petitioner’s use of improper hindsight to pick and choose pieces from the asserted art in an attempt to meet the claimed invention. Dr. Viz, ¶76. This is shown by the different rail car designs that Petitioner relies on as allegedly showing other rail cars with end walls, without any meaningful description of the process by which a POSITA would start in view of one rail car and end up in view of the others. Ahmadian Decl., ¶79; Petition, 43-45; Dr. Viz, ¶74.

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Petitioner has not shown a reasonable likelihood that this claim limitation is taught or rendered obvious by the asserted art. *See* Dr. Viz, ¶¶69-77.

iii. Claim Limitation 1g

Limitation 1g requires:

said shear plate has a longitudinally outboard margin and said draft sill has a striker located outboard of said longitudinally outboard margin of said shear plate, and said end post is one of: (a) rooted to said draft sill adjacent to said striker; (b) rooted to said shear plate adjacent to said longitudinally outboard margin of said shear plate.

Petition, 46. The Petition alleges that a combination of Hart and the 1906 Cyclopedia's Cambria Steel car meets this claim limitation, and specifically subpart (a). Petition, 46-48. The Petition, however, does not argue that the end post is "(b) rooted to said shear plate adjacent to said longitudinally outboard margin of said shear plate." Ahmadian Decl., ¶¶ 82-90; Petition, 46-48; Dr. Viz, ¶78. Moreover, the Petition does not explain how the added end post in the combination is "rooted to said draft sill adjacent to said striker." Dr. Viz, ¶79. In fact, as explained above in Section IV.C.ii, a POSITA would not have been motivated to add an "end post" to Hart, let alone one "rooted to said draft sill adjacent to said striker." Dr. Viz, ¶79.

Petitioner has not shown a reasonable likelihood that this claim limitation is taught or rendered obvious by the asserted art. Dr. Viz, ¶¶78-80.

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iv. Claim Limitation 1h

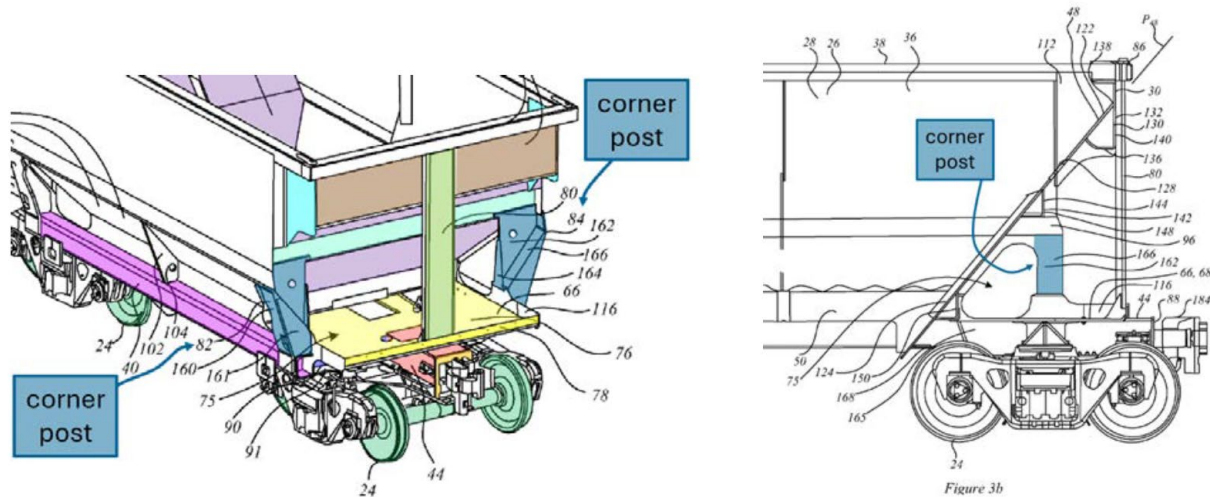
Limitation 1h requires:

said bolster has first and second laterally outboard distal ends, and said hopper car has corner posts extending upwardly from said distal ends of said bolster to said first end slope sheet.

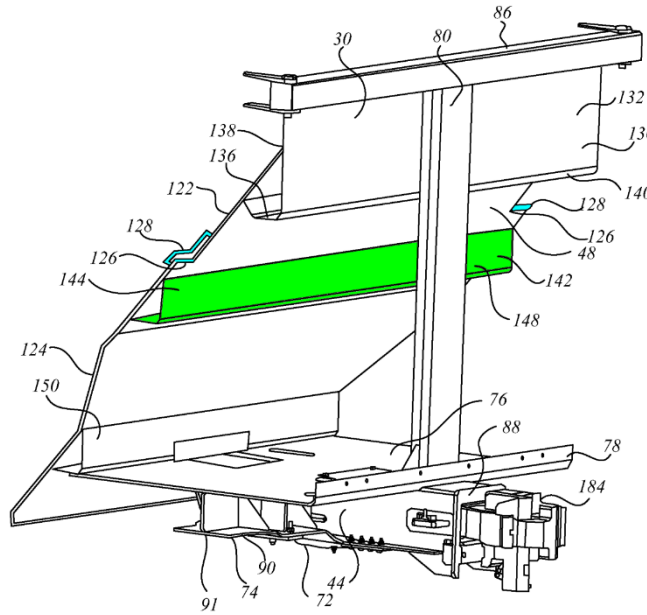
Petition, 48. The Petition relies on Hart to show this limitation. Dr. Viz, ¶81.

As an initial matter, Hart does not call d' a “corner post” but simply refers to the structure as a “post” or “stake.” Dr. Viz, ¶82. A POSITA would have realized that there is a difference between a “corner post” (which is typically understood to be at the physical corner of the hopper, which is not the case in Hart) and a standard “post” or “stake,” which Hart refers to. *Id.* Corner posts typically have a “beefier” design (*i.e.*, more cross-sectional area) because they are more aggressively loaded than typical side posts. *Id.*

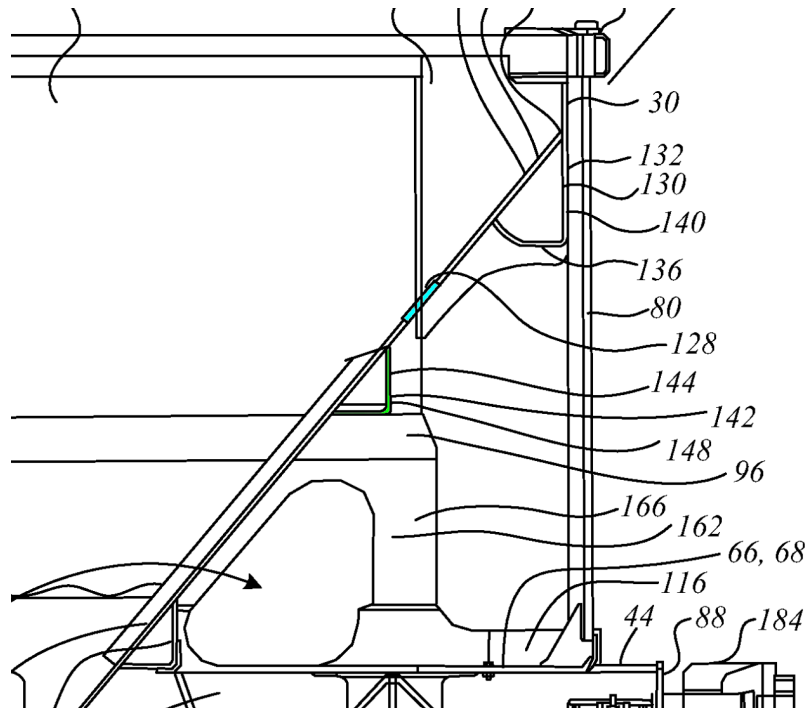
Dr. Ahmadian and Petitioner inconsistently identify the claimed “corner posts” in the figures of the '515 Patent:



Dr. Viz, ¶83. Figure 3b (above, on the right) shows a cut-away view of a portion of the rail car, looking towards the inside of the shown corner post. Dr. Viz, ¶83. As the '515 Patent explains: “[u]pper member 122 has notches 126 formed therein to accommodate corresponding corner posts 82, 84 as may be, with local reinforcement doublers 128 at the junction.” ’515 Patent, 16:37-39; Dr. Viz, ¶84. Notches 126 and local reinforcement doublers 128 are shown as being above angle 142, in both Figure 3b cited by Petitioner, and in Figure 3a as shown below:



'515 Patent, Fig. 3a (showing notches 126 and local reinforcement doublers 128 in blue and angle 142 in green). Dr. Viz, ¶184.



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'515 Patent, Fig. 3b (showing local reinforcement doublers 128 in blue and angle 142 in green). Dr. Viz, ¶84. Thus, the claimed corner posts extend above angle 142, to notches 126, and not below it, as Petitioner suggests. Dr. Viz, ¶84. This is an important distinction because the structures in Hart that Petitioner identifies as “corner posts” extend to the structure b^{10} and not to the structure Petitioner identifies as an “end slope sheet.” *Id.*, ¶85.

Thus, the Petition has not shown that the alleged “corner posts” in Hart “extend[] upwardly from said distal ends of said bolster to said first end slope sheet.” *Id.*, ¶86.

Petitioner has not shown a reasonable likelihood that this claim limitation is taught or rendered obvious by the asserted art. *See id.*, ¶¶81-87.

v. Claim Limitation 1i

Limitation 1i requires:

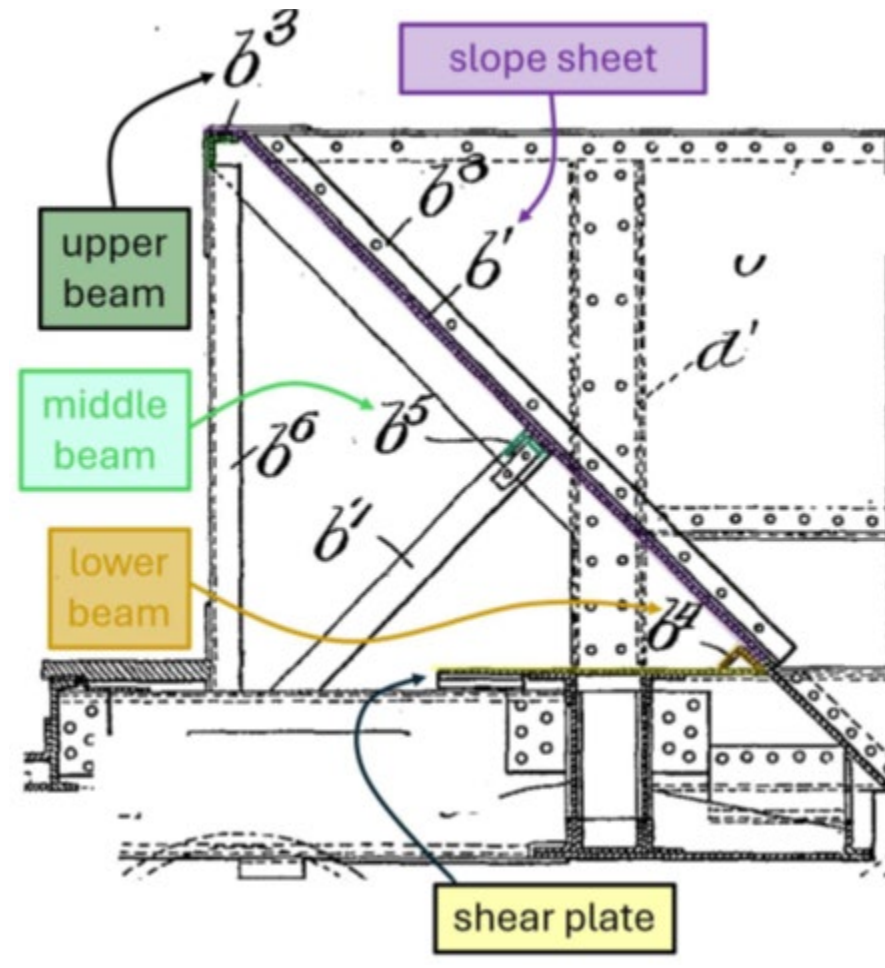
said hopper car has a machinery space bounded by (a) said first end slope sheet; (b) said shear plate of said first end section; (c) said end post; and (d) said corner posts, and said machinery space is free of any other primary structure.

Petition, 52. Hart does not teach or suggest, *inter alia*, the claimed “machinery space.” Dr. Viz, ¶88. As discussed above, in Section IV.C.ii, Petitioner fails to provide any teaching or suggestion in the asserted art as to why a POSITA would

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add an “end post” to Hart, or why the alleged “corner posts” in Hart meet the limitations of the claims. *Id.* Without the elements of the claims that “bound” the “machinery space,” such a machinery space cannot exist. *Id.*

Moreover, even with Petitioner’s interpretation of an “end post” and “corner post” in Hart, the Petition does not show that what they identify as the “machinery space” in Hart is free of primary structure. Dr. Viz, ¶89. Specifically, Hart’s post *b*⁷ and the un-numbered beam to which it attaches are in the area in Hart that Petitioner and Dr. Ahmadian identify as the machinery space. *Id.* Petitioner identifies the “slope sheet” as follows:



Petition, 38; Dr. Viz, ¶89.

Petitioner has not shown a reasonable likelihood that this claim limitation is taught or rendered obvious by the asserted art. *See id.* ¶¶88-90.

For at least these reasons, the Petition has not shown a reasonable likelihood that the asserted art discloses or renders obvious claim 1, much less claim 2, which depends on claim 1 and includes further patented subject matter. Therefore, the Petition has not established a reasonable likelihood of prevailing on Ground 1.

D. Ground 2

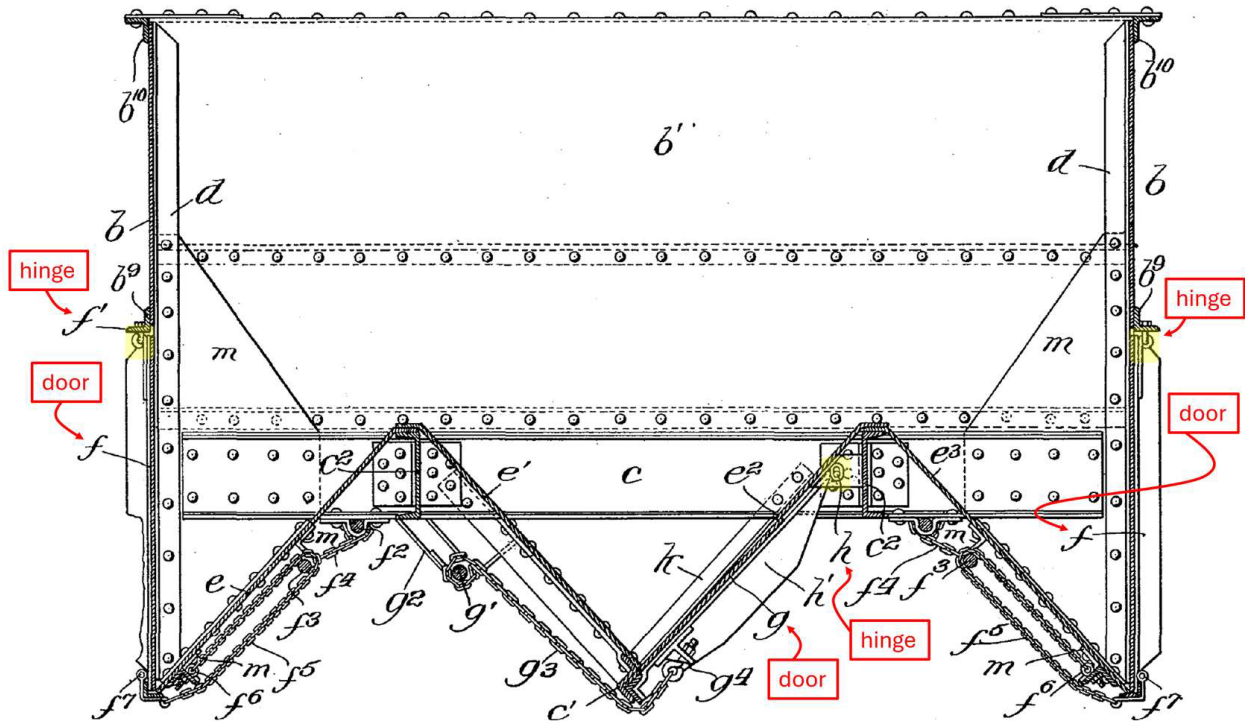
Petitioner asserts that claim 3 is obvious over Hart, the 1906 Cyclopedia, and Schuller. Petition, 50. As discussed below, the Petition fails to establish a reasonable likelihood that the proposed combination of asserted art renders obvious claim 3. Dr. Viz, ¶91.

Claim 3 requires, in part:

a longitudinally acting pneumatic actuator is at least partially lodged in said machinery space directly above said draft sill.

Petition, 53. For the reasons discussed above, with respect to claim limitation 1i, the Petition fails to show that the asserted art teaches or renders obvious the claimed “machinery space.” *See* Section VI.C.v. Thus, there is no “machinery space directly above said draft sill” in the asserted art in which a “longitudinally acting pneumatic actuator” can be “at least partially lodged.” *Id.*

A POSITA would not have been motivated to combine Schuller's mechanism with Hart because the proposed combination would render Hart unsatisfactory for its intended purpose. *Id.*, ¶93. A POSITA would understand that the crux of Hart is to provide a convertible rail car with both side and bottom discharge. *Id.* Hart's door opening mechanism is specifically designed to open either the side or bottom doors of its rail car, as recognized by Petitioner:



Ahmadian Decl., ¶95; Petition, 51; Dr. Viz, ¶93. Accordingly, Petitioner has not shown that a POSITA would be motivated to make their proposed modifications. Dr. Viz, ¶94.

Petitioner has not met its burden to show a reasonable likelihood that this claim is invalid or that it will prevail on Ground 2. *See id.*, ¶¶92-95.

E. Ground 3

Petitioner asserts that claim 4 is obvious over Hart, the 1906 Cyclopedia, Schuller, and Karig. Petition, 53. The Petition fails to establish a reasonable likelihood that the proposed combination of asserted art would render obvious claim 4. Dr. Viz, ¶96.

Claim 4 requires, in part:

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wherein a brake reservoir is also at least partially lodged
in said machinery space.

Petition, 53. For the reasons discussed above, with respect to claim limitation 1i, the Petition fails to show that the asserted art teaches or renders obvious the claimed “machinery space.” Dr. Viz, ¶¶97. Thus, claim 4’s “brake reservoir” cannot be “at least partially lodged in said machinery space directly above said draft sill.” *Id.*

Petitioner has not met its burden to show a reasonable likelihood that this claim is invalid or that it will prevail on Ground 3. *See id.*, ¶¶97-98.

F. Ground 4

Petitioner asserts that claims 5 and 6 are obvious over Hart, the 1906 Cyclopedia, and Campbell '652. Petition, 54. The Petition fails to establish a reasonable likelihood that the proposed combination of asserted art renders obvious either of claims 5 or 6. Dr. Viz, ¶¶99.

i. Claim 5

Claim 5 requires, in part:

[5d] said side sill has an upper flange, said upper flange of said side sill being substantially co-planar with, and connected to, said shear plate; and [5e] said side sill has a lower flange, said lower flange of said side sill being substantially co-planar with a respective one of said distal end portions of said lower flange of said main bolster.

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Petition at 57. Petitioner relies on Campbell '652 for these claim features, admitting that "Hart's figures do not show the vertical position of the flanges of the side sills." Ahmadian Decl., ¶104; Petition, 57; Dr. Viz, ¶100.

Petitioner provides no justification for combining Campbell '652 and Hart, other than "to facilitate their interconnection to form a single strong undercarriage structure." Dr. Viz, ¶101. For instance, Petitioner does not state that Hart has a weak undercarriage structure, or provide any support for its position that having flanges on different planes would not provide a strong undercarriage structure. *Id.* Instead, using improper hindsight, Petitioner picks and chooses features from the asserted art solely for purposes of meeting the language of the claims, without considering any other reason for its proposed combination, or even whether the proposed combination would have been successful. *Id.* Absent a reason that justifies the added cost and weight of the modifications the Petitioner proposes, a POSITA would not have made the proposed changes. *Id.*

Petitioner has not met its burden to show a reasonable likelihood that this claim is invalid. *See id.*, ¶¶100-102.

ii. Claim 6

Petitioner relies only on its discussion of claim limitation 5d for this claim. Petition, 58. Accordingly, for the reasons discussed above, regarding claim limitation

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5dVI.F.i, Petitioner has not met its burden to show a reasonable likelihood that this claim is invalid. *See* Dr. Viz, ¶¶103-104.

For at least these reasons, the Petition does not establish a reasonable likelihood that either of claims 5 or 6 is invalid, or that it will prevail on Ground 4.

G. Ground 5

Petitioner asserts that 7–16, 20, 23, 24–28, and 30–31 are obvious over Hart in view of the 1906 Cyclopedia and Wong. Petition at 58. The Petition fails to establish a reasonable likelihood that the proposed combination of asserted art renders obvious any of claims 7–16, 20, 23, 24–28, or 30–31. Dr. Viz, ¶105.

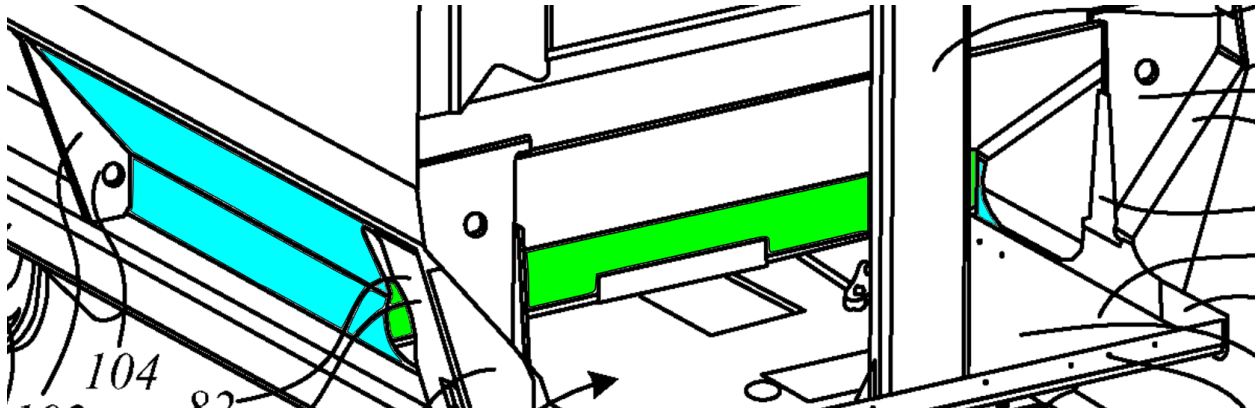
i. Claim Limitation 7f

Limitation 7f requires:

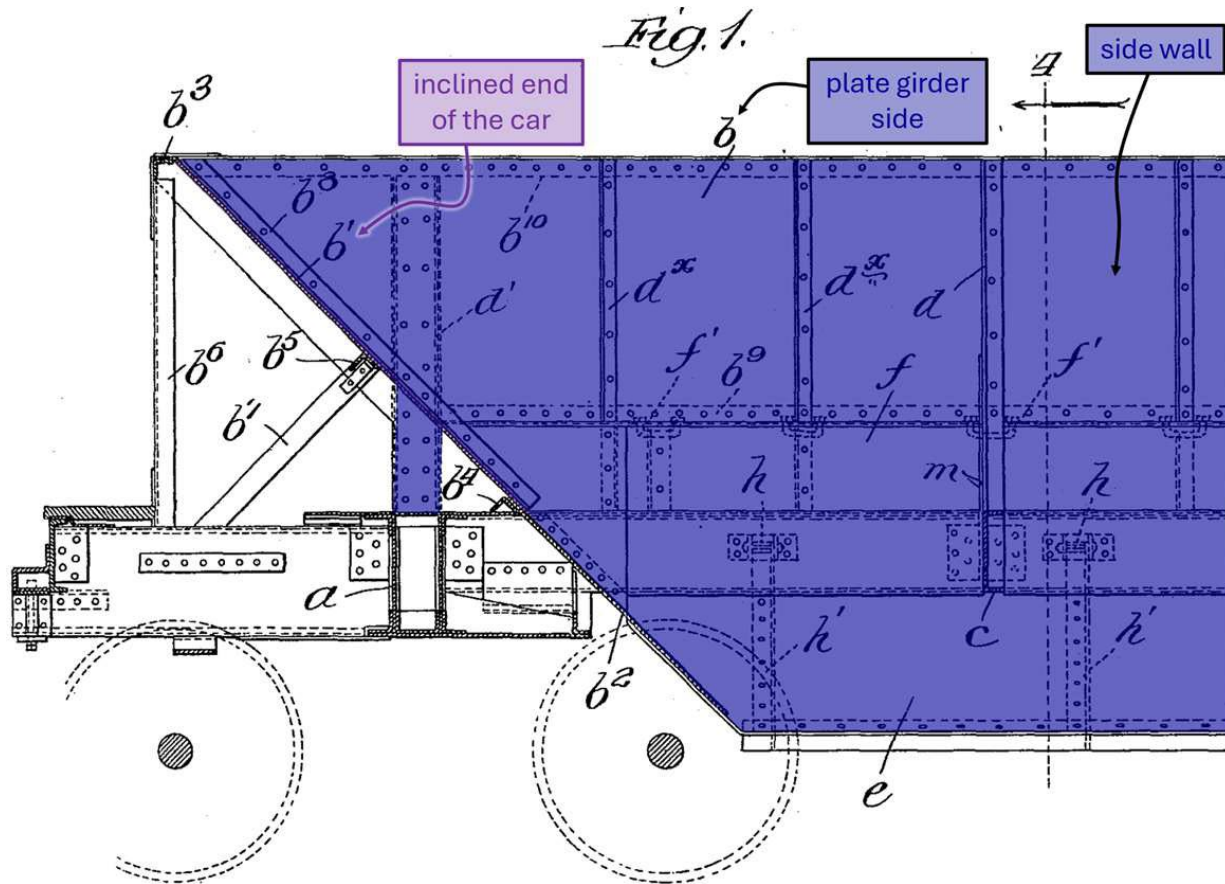
a first laterally extending reinforcement mounted cross-wise to said first end slope sheet adjacent to said shear plate; said shear plate of said first end section being connected to said first laterally extending reinforcement; said first end slope sheet of said first end section being connected to said first laterally extending reinforcement; said first laterally extending reinforcement defining part of a first hollow section beam extending across said hopper car between said first and second side walls.

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Petition, 60. As described in the '515 Patent and recited in this claim limitation, the “first hollow section beam extending across said hopper car between said first and second side walls” (shown in the annotated enlarged partial view of Figure 1 reproduced below), angle 150 extends between the first and second side walls:



'515 Patent, Fig. 1 (showing portions of side walls in blue and angle 150 in green); Dr. Viz, ¶106. Comparatively, as seen in the Petition's interpretation of Hart (shown below), Hart's crosswise beam b^4 does not extend between the side walls, but, instead, sits between the outside edges of the hopper, with no side sheet abutting them:



Petition, 59. Dr. Viz, ¶107. Petitioner does not explain why the structure b^4 meets the claim limitation “a first hollow section beam extending across said hopper car between said first and second side walls.” Dr. Viz, ¶107.

Additionally, claim limitation 7f states that the crosswise beam must be connected to the shear plate. *Id.*, ¶108. Figure 2 in Hart does not show this connection since there is only one line of fasteners, and these fasten the crosswise beam to the slope sheet, not to the shear plate. *Id.* Hart’s figures show fastened structures that are not welded, and a welded structure would not be expected at the time of the Hart’s invention. Distinctively, the crosswise beam in the ’515 Patent (item 150) would be

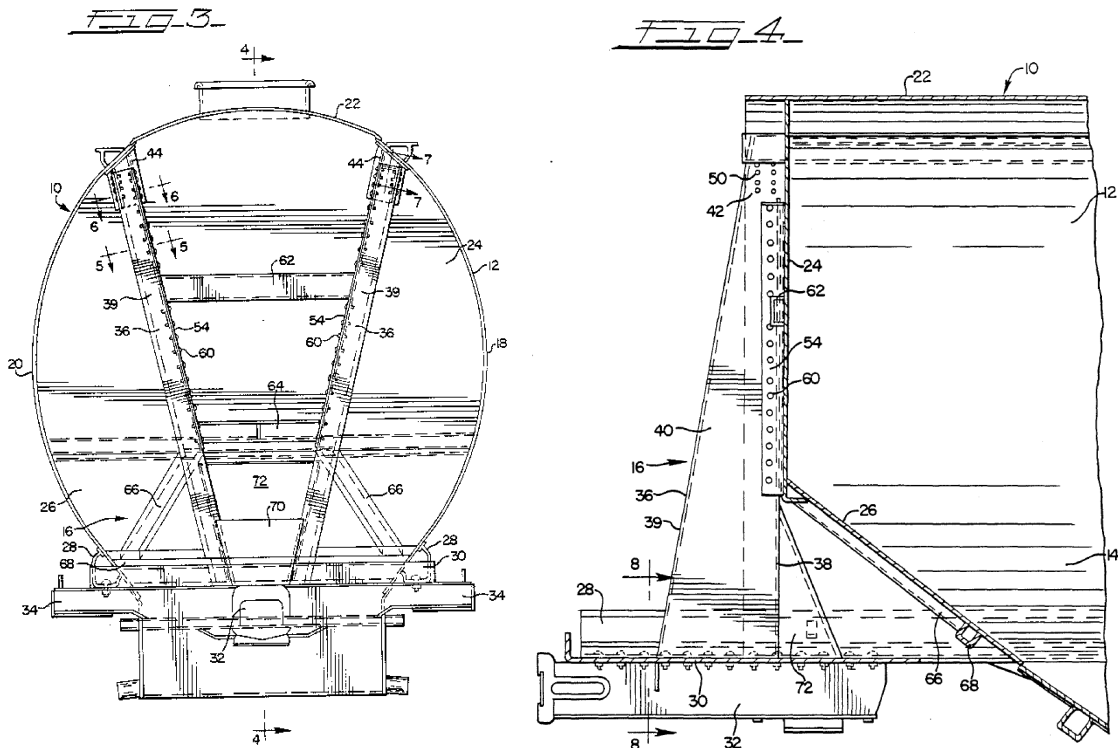
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expected to be welded along its length, with the item 150 connected to the shear plate. *Id.* This is different than what is represented in Hart. *Id.*

Petitioner has not met its burden to show a reasonable likelihood that this claim limitation is rendered obvious by the asserted. *See id.*, ¶¶106-109.

ii. Claim Limitation 7h

The Petition states that a POSITA would combine Hart with Wong to add a first cross-wise extending beam. Petition, 62-64. Wong teaches an aluminum closed hopper rail car with a steel end structure:

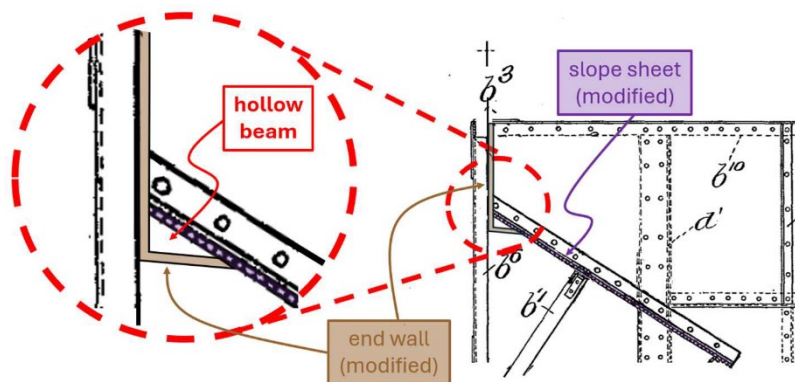


EX1006, Wong, Figs. 3, 4; Dr. Viz, ¶110.

Wong teaches how to combine steel and aluminum structure to get needed strength while avoiding the corrosion issues that arise because steel and aluminum

are galvanically coupled and will corrode if in contact with each other. Dr. Viz, ¶111. Wong is far less concerned regarding lateral reinforcing beams. *Id.* The L-bracket detail shown in Wong is not similar to the claimed “first crosswise beam” because it is the joint where the slope sheet is connected to the end vertical sheet. *Id.* Wong does not provide reinforcement, but simply shows two sheets being connected for lading containment and load transfer. *Id.* The claimed “first crosswise beam” provides reinforcement to the slope sheet; a POSITA in the relevant time frame would understand and appreciate this difference. *Id.* A POSITA would not look towards Wong to improve the end structure of Hart. *Id.*

In fact, the proposed combination of Hart and Wong is unsatisfactory for either rail car's intended purpose. Dr. Viz, ¶113. Hart already has structure for holding up what the Petitioner identifies as the end slope sheet. *Id.* It is not clear how the proposed cross-wise beam in Hart would transfer load directly down from the end slope sheet to the undercarriage of the car:



Petition, 63; Ahmadian Decl., ¶108; Dr. Viz, ¶113. A POSITA would have understood that adding a redundant beam would require substantial time investments for the redesign and requisite analyses.

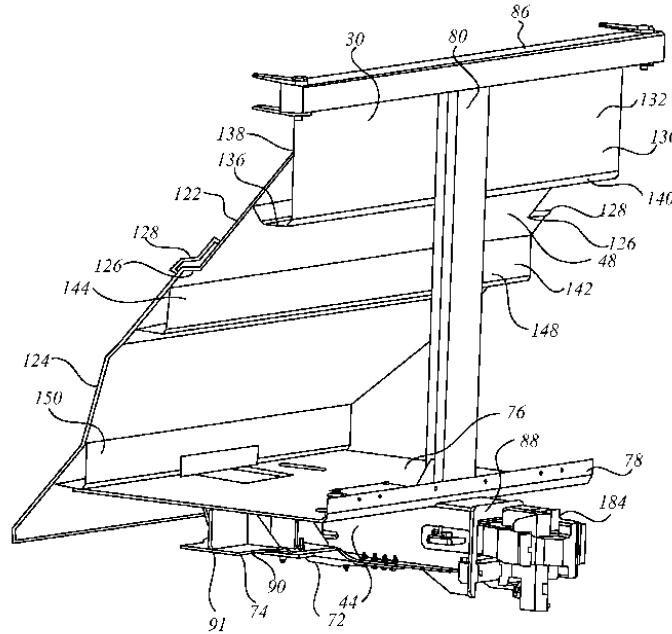
Petitioner has not met its burden to show a reasonable likelihood that this claim limitation is rendered obvious by the asserted art. *See* Dr. Viz, ¶¶110-114.

iii. Claim 9

The Petition admits that Hart's brace member b^4 is mounted "against the shear plate, rather than against the slope sheet." Petition, 65. The Petition relies on Wong to show that which Hart does not teach. Dr. Viz, ¶115.

A POSITA would not look to combine Hart and Wong to reach the present invention. Dr. Viz, ¶116. Instead, a POSITA would take a wholistic view of the rail cars to determine if additional strengthening is required, and if so, look to incorporate an entire design, not specific elements; and with such a wholistic view, the POSITA would not have attempted to, much less combine Hart and Wong as proposed by the Petition. *Id.*

Moreover, the proposed modification is not "very simple . . . involv[ing] re-orienting the angle iron" as Petitioner suggests. Petition, 65-66; Dr. Viz, ¶117. In fact, it would have been unclear to a POSITA how the modified angle in Hart would be mounted. Dr. Viz, ¶117. Notably, the '515 Patent discloses, and a POSITA would understand, that space needs to be left to weld the angle iron to the shear plate and end slope sheet:



'515 Patent at Fig. 3a (showing space to make welds); Dr. Viz Decl. ¶118.

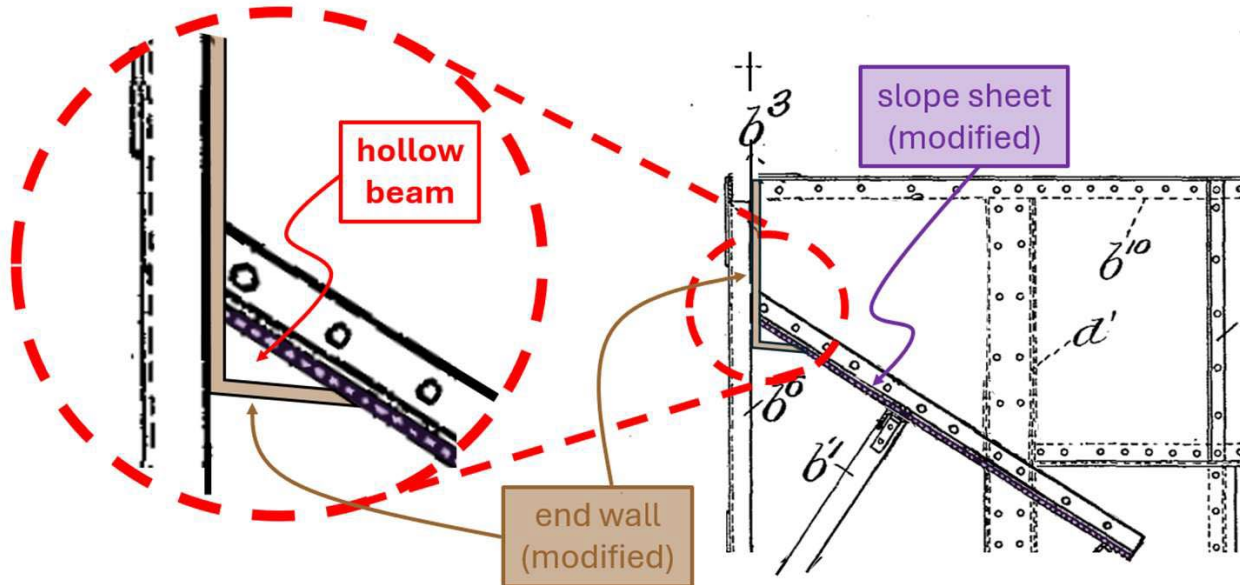
Petitioner has not met its burden to show a reasonable likelihood that this claim is invalid. *See* Dr. Viz Decl. ¶¶115-119.

iv. Claim 12

Based entirely on its discussion of limitation 7h, the Petition contends claim 12 is met by the combination of Hart and Wong. Petition, 67; Dr. Viz, ¶120. Dr. Ahmadian provides no opinions regarding claim 12 or its limitations. *Id.* Accordingly, for the reasons discussed above, regarding claim limitation 7h, the asserted art does not render obvious this claim and Petitioner has not met its burden to show a reasonable likelihood that this claim is invalid. *See* Dr. Viz Decl. ¶¶120-121.

v. Claim 13

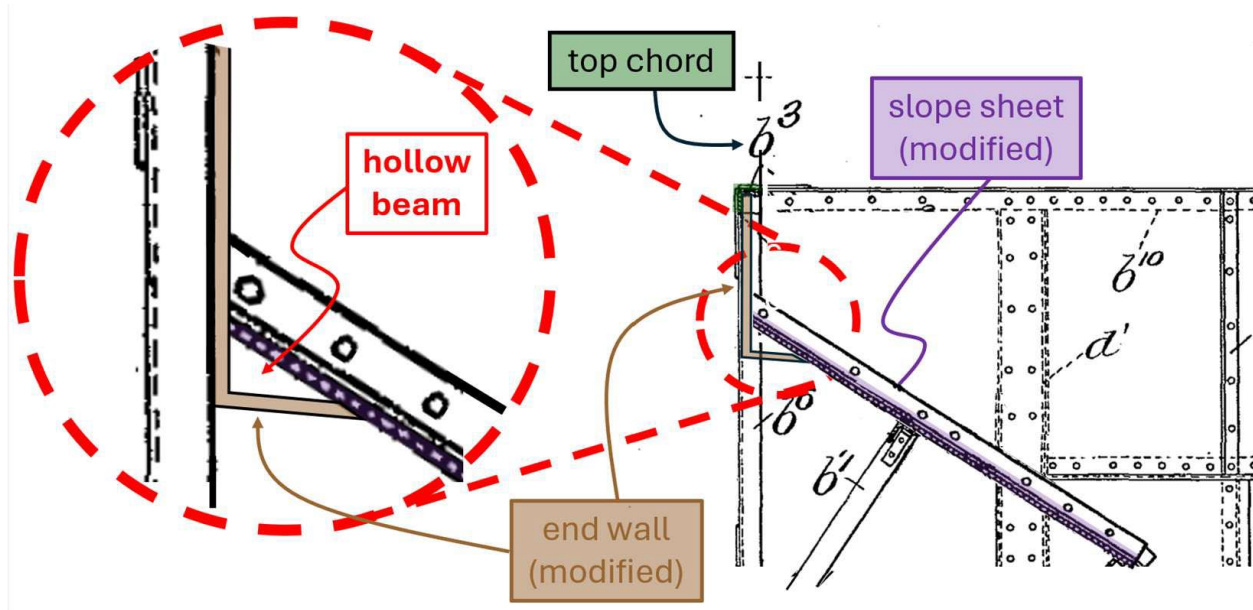
The Petition contends that “Hart, as previously modified by Wong, discloses the elements of Claim 13.” Petition, 68. Petitioner’s arguments are entirely inconsistent with its earlier arguments for claim limitation 7h. Dr. Viz, ¶123. There, Petitioner discusses removing top chord b^3 and replacing it with Wong’s transverse beam. Petition, 63 (“This suggests using a transverse beam like Wong’s in the modified Hart design, in which the slope sheet is no longer supported by the upper beam b^3 .”). Petitioner’s combination of Hart and Wong thus requires the removal of the top chord b^3 as shown in Petitioner’s modified drawing showing the combination:



Petition, 64 (showing b^3 removed, despite the label being present); Dr. Viz, ¶123.

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Contrarily, and for reasons unknown, Petitioner changes its argument to re-add top chord b^3 back into its proposed modification, as shown below:



Petition, 68 (showing b^3 added back in); Dr. Viz, ¶124. Petitioner provides no justification for its change in position. Dr. Viz, ¶124. It is evident from Petitioner's change in position, however, that this claim limitation is not taught by the asserted art. *Id.*

Petitioner has not met its burden to show a reasonable likelihood that this claim is invalid. *See id.*, ¶¶122-125.

vi. Claim 14

The Petition asserts that claim 14 is obvious over Hart in view of the 1906 Cyclopedia's Cambria Steel Car and incorporates its arguments from limitation 1f. Petition, 69-70. Accordingly, for the reasons discussed above, regarding claim

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limitation 1f, the asserted art does not render obvious this claim and Petitioner has failed to show a reasonable likelihood that this claim is invalid. *See id.*, ¶¶126-127.

vii. Claim 15

Petitioner states that Hart discloses the claimed intermediate beam, but shows a modified picture of Hart that includes top chord b^3 , despite Petitioner and Dr. Ahmadian removing that same top chord b^3 in their discussion of claim 7. Dr. Viz, ¶128. Accordingly, it is not clear what combination Petitioner is referring to for this claim, especially since claim 15 depends on claim 7 and, therefore, includes all of the subject matter recited in claim 7. *Id.*

Petitioner has not met its burden to show a reasonable likelihood that this claim is invalid. *See id.* ¶¶128-129.

viii. Claim 16

The Petition and Dr. Ahmadian allege that the combination of Hart and Wong meets this claim. Petition, 71-72. A POSITA would find no motivation in view of Hart or Wong to modify Hart as suggested by Petitioner. Dr. Viz, ¶131. Wong does not have an intermediate beam but, instead, has a number of “channel stiffener members” that are used as part of a larger structure to transfer load from what the Petitioner identifies as the end slope sheet to the end stiffener member 36. *Id.* In fact, of the channel stiffener members identified by Petitioner, only one of them, labeled

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68, is on what the Petitioner identifies as the end slope sheet; the others are on the end wall and the door. *Id.* Thus, a POSITA would not look towards Wong to modify Hart's intermediate beam. *Id.*

Dr. Ahmadian is wrong in his position about what Wong is showing as a beam at the juncture of the slope sheet and end wall. Dr. Viz, ¶132. It is not a beam, but simply a 90-degree formed edge of the lower vertical extent of the end wall. *Id.* Such a formed edge cannot be "re-oriented" because it is part of the end wall.

In addition, the proposed combination would be unsatisfactory for the intended purpose of any of the asserted art in the proposed combination. *Id.*, ¶133. Hart's beam b^7 provides support to the intermediate beam b^5 . Both beams b^7 and b^5 support the slope sheet from the hydrostatic pressure load provided by the commodity when the car is full. *Id.* Orienting it the way Petitioner suggests would make it unable to do so and render it useless. *Id.* This concern is unaddressed by Petitioner. *Id.* Moreover, Petitioner selects and uses elements from Wong to modify Hart without a reasonable engineering analysis being performed, which a POSITA in the relevant time frame certainly would have done before suggesting that any of the changes proposed by the Petitioner and/or Ahmadian be made. *Id.*, ¶134.

Petitioner has not met its burden to show a reasonable likelihood that this claim is invalid. *See id.* ¶¶130-135.

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ix. Claim Limitation 20f

Petitioner relies solely on its discussion of claim limitation 7f for this claim limitation. Petition, 73. Accordingly for the reason discussed above, regarding claim limitation 7f, in Section IV.G.i, the asserted art does not render obvious this claim limitation. Dr. Viz, ¶¶136-137.

x. Claim Limitation 20h

Petitioner relies solely on its discussion of claim limitation 1h for this claim limitation. Petition, 74. For the reasons discussed above regarding claim limitation 1h, in Section VI.C.iv, the asserted art does not render obvious this limitation. Dr. Viz, ¶138.

xi. Claim Limitation 20j

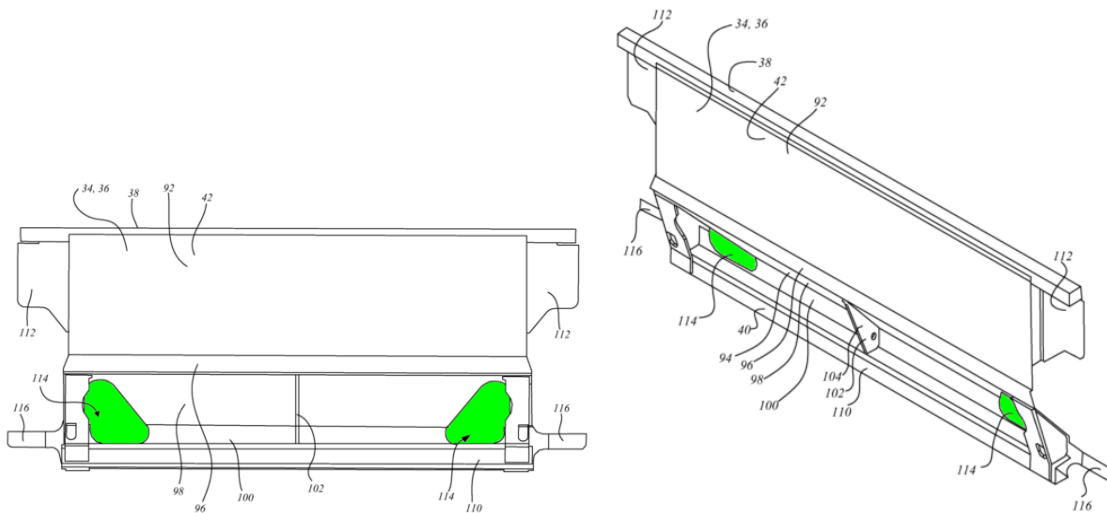
Petitioner relies solely on its discussion of claim limitation 1i for this claim limitation. Petition, 75. For the reasons discussed above regarding claim limitation 1i, in Section VI.C.v, the asserted art does not render obvious this limitation. Dr. Viz, ¶139.

xii. Claim 23

Petitioner asserts that Hart discloses this claim. Petition, 75-76. Dr. Ahmadian provides no opinions regarding this claim. Dr. Viz, ¶140. As explained in the '515 Patent specification, "[t]he lower region of the main sidewall sheet also includes

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lightening apertures 114, in the space between the corner posts and the slope of the end slope sheets.” ’515 Patent at 16:26-30. As such, a POSITA would understand that the claimed “openings” are the apertures in the sidewall sheet:



’515 Patent, Figs. 2b and 2a (shown above with annotations to show apertures 114 in green); Dr. Viz, ¶¶140-141.

Petitioner, ignoring what a POSITA would understand to be the clear meaning of the claim, contends the claimed “corner posts” are part of the claimed “side wall.” *Id.*, ¶142. Nowhere in the specification or the claims are the corner posts called part of the “side wall.” *Id.* The only support that Petitioner can offer is from the brief description of the drawings, where Fig. 2b is described as showing “a side view of the sidewall” and includes portions of the corner posts. *Id.* However, Fig. 3b is described as being a view of the “end structure” of the rail car, but shows the side wall as well. Thus, the figures include features outside of their description. A

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POSITA would understand to look towards the detailed description and the claims to understand the claimed invention.

Moreover, the “apertures” would be considered by a POSITA to be somewhat like a stiffening web for the laterally outboard surface of the corner posts. Dr. Viz, ¶143. Just like the shear plate forms the top flange of the draft sill beam, the side wall apertures would be understood by a POSITA to form the outer flange of the corner post columns. *Id.* Thus, they not only lighten the structure, but also provide structural benefits. *Id.* They may lighten the structure overall, but a POSITA would also recognize these as a unique feature that also provides structural benefits. Such features do not exist in the asserted art. *Id.*

Petitioner has not met its burden to show a reasonable likelihood that this claim is invalid. *See id.*, ¶¶140-144.

xiii. Claim Limitation 24f

Petitioner relies solely on its discussion of claim limitation 7h for this claim limitation. Petition, 77. For the reasons discussed above regarding claim limitation 7h, in Section VI.G.ii, the asserted art does not render obvious this limitation. Dr. Viz, ¶145.

xiv. Claim Limitation 24i

Petitioner relies solely on its discussion of claim limitation 7h for this claim limitation. Petition, 78. For the reasons discussed above regarding claim limitation 7h, in Section VI.G.ii, the asserted art does not render obvious this limitation. *Id.*, ¶146.

xv. Claim 25

Petitioner relies solely on its discussion of claim 14 for this claim. Petition, 78. As discussed above regarding claim 14, in Section VI.G.vi, the asserted art does not render obvious this limitation. *Id.*, ¶147.

xvi. Claim 26

Petitioner relies on its discussion of limitation 1f for this claim. Petition, 79. For the reasons discussed above, regarding limitation 1f, in Section IV.C.ii, the asserted art does not render obvious this claim. Dr. Viz, ¶148.

The Petition cites Ahmadian Decl. ¶116 for its discussion of claim 26. Petition, 79-80. However, ¶116 relates to Dr. Ahmadian's discussion related to claim 19. The Petition never establishes that claims 19 and 26 have the same limitations or would be considered the same by a POSITA. Dr. Viz, ¶149.

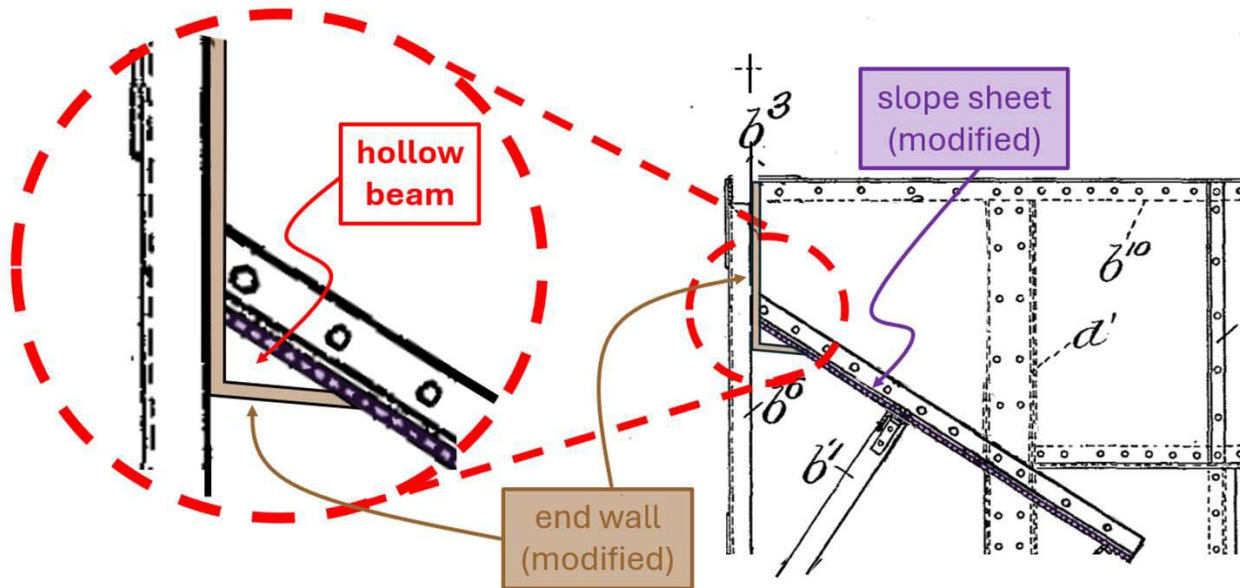
The Petition admits that what it identifies as the end post in the Cambria Steel car does not extend to what it identifies as the top chord. *Id.* ¶150; EX1009, 13, Fig.

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53. The Petition picks one of the other eight cars shown on the selected pages of the 1906 Cyclopedia to argue that this limitation would be met if *that* car was combined with the combination of Hart and the Cambria Steel car. Dr. Viz, ¶150. The Petition offers no reason or basis for picking and choosing structures from other cars and adding them to Hart—that is, other than in an attempt to meet the claim limitation. *Id.*

Moreover, the Cambria Steel car that the Petitioner and Dr. Ahmadian reference shows not an end post, but a vertical end ladder that would have been accessed to actuate the hand brake wheel that is shown at the top of the car. Petition, 79; EX1009, 14; Dr. Viz, ¶151. Rail cars built then had hand brake wheels horizontally oriented at the top of the car, not on the end of the car vertically mounted as today. Dr. Viz, ¶151. A POSITA would have recognized that a ladder stile is not an end post because structural requirements for each are vastly different. *Id.*

As discussed with respect to claim 13, Petitioner's addition of an end wall to Hart explicitly removes the structure b^3 that Petitioner identifies as the top chord. *Id.*, ¶152; Petition, 63 (“This suggests using a transverse beam like Wong's in the modified Hart design, in which the slope sheet is no longer supported by the upper beam b^3 .”).



Petition at 64 (showing b^3 removed, despite the label being present). Now, for claim 26, the structure b^3 identified by Petitioner as the top chord is added back into Hart without any basis or explanation. Dr. Viz, ¶152. A POSITA would not add and remove structure from a rail car with such abandon. *Id.*, ¶153.

In addition, a POSITA would not have been motivated to attempt much less make the combination proposed by Petitioner – a POSITA would have recognized the structure of Hart, as disclosed, was sound and did not need further reinforcement. *Id.*

Petitioner has not met its burden to show a reasonable likelihood that this claim is invalid. *See id.*, ¶¶148-154.

xvii. Claim 27

Petitioner relies solely on its discussion of claim limitation 1h for this claim. Petition, 81. For the reasons discussed above regarding claim limitation 1h, the asserted art does not render obvious this claim. Dr. Viz, ¶155.

xviii. Claim 28

Petitioner relies solely on its discussion of claim limitation 1i for this claim. Petition, 81. For the reasons discussed above regarding claim limitation 1i, the asserted art does not render obvious this claim. Dr. Viz, ¶156.

xix. Claim 30

Petitioner relies solely on its discussion of claim limitation 7h for this claim. Petition, 81. For the reasons discussed above regarding claim limitation 7h, the asserted art does not render obvious this claim. Dr. Viz, ¶157.

xx. Claim 31

Petitioner relies solely on its discussion of claim 16 for this claim. Petition, 81. For the reasons discussed above regarding claim 16, the asserted art does not render obvious this claim. Dr. Viz, ¶158.

For at least these reasons, the Petition does not establish a reasonable likelihood of prevailing on Ground 5.

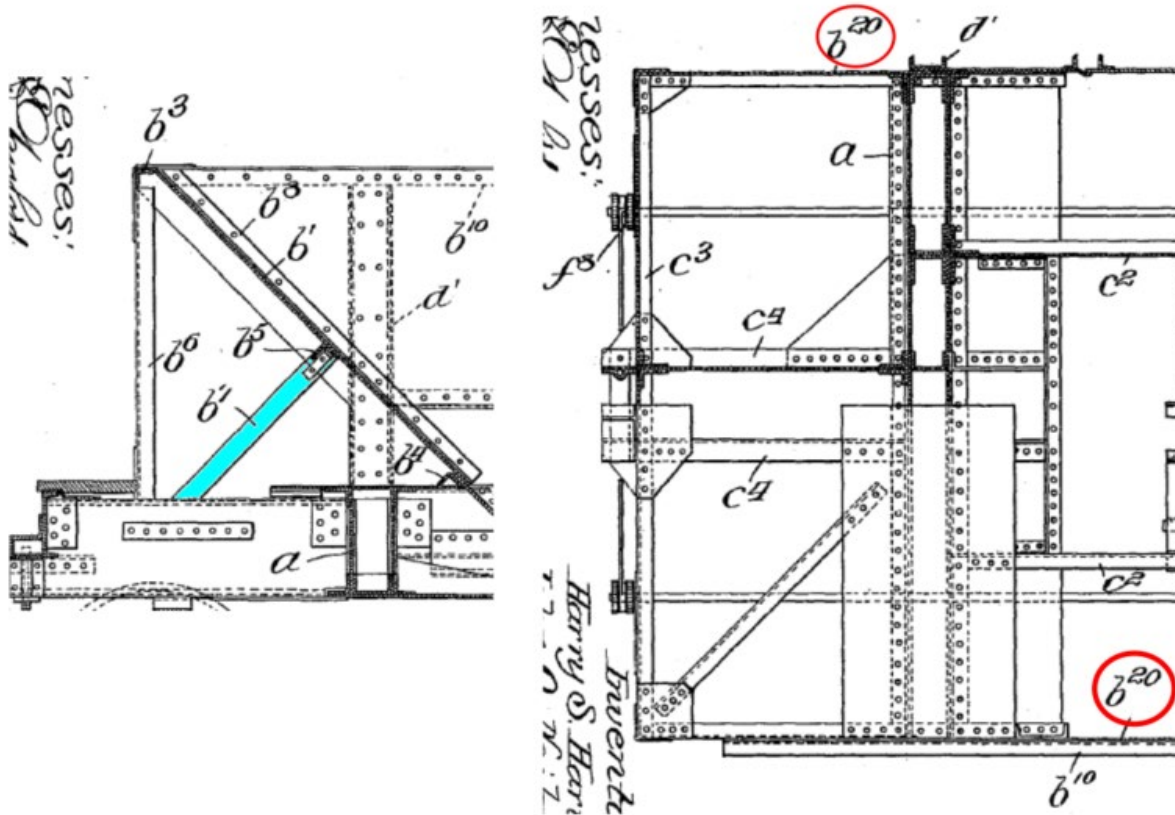
H. Ground 6

Petitioner contends that claims 17-19 are obvious over Hart in view of the 1906 Cyclopedia, Wong, and Campbell '051. Petition, 81. As set forth below, the Petition fails to establish a reasonable likelihood that the asserted art renders obvious any of claims 17-19. Dr. Viz, ¶159.

i. Claim 17

Petitioner asserts incorrectly that the combination of Hart and Campbell '051 meets this claim limitation. Petition, 82-83.

As recognized by Petitioner, Campbell '051 includes an “offset section 18 for the purpose of accommodating the usual ladder rungs 23 within the permissible overall width of the car.” EX1012, 1:90-94; Petition at 83; Dr. Viz. Decl. ¶160. While Petitioner proposes modifying Hart in view of Campbell '051, Petitioner does not explain how incorporating Campbell '051's stepped sections would impact the operation, performance, or other characteristics of Hart's rail car; particularly since it would likely make Hart's rail car inoperable for its intended purpose. Dr. Viz, ¶161. Petitioner takes the position that Hart's inclined brace b^7 is located on side sill b^{20} . *Id.*; Petition, 40 (“inclined brace b^7 is mounted to the side sill and extends upwards in a vertical plane, without extending laterally inward into the machinery space or above the shear plate.”).



EX1008, Figs. 1, 3 (blue highlighting to show b^7 , red circles to show b^{20}): Dr. Viz, ¶161.

If Petitioner's proposed modification were to be adopted, incorporating Campbell '051's stepped sections into Hart would require the movement of inclined brace b^7 , as any added ladder would necessarily be in the same location as inclined brace b^7 . Dr. Viz, ¶162. A POSITA would not have expected the modification of moving and reconfiguring the structural supports in Hart, as proposed by Petitioner because the Hart car did not need safety appliances such as end or side ladders because the entire railcar itself was not that tall. *Id.* In other words, personnel could

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access the top-most portions of the car by standing on the longitudinally outboard extent of the draft sill or other related outboard features and would be able to easily access all top-most components of the rail car. *Id.* No POSITA would consider making such a change to the railcar defined by Hart. *Id.*

Petitioner has not met its burden to show a reasonable likelihood that this claim is invalid. *See id.*, ¶¶160-163.

ii. Claim Limitation 18f

Petitioner relies solely on its discussion of claim limitation 7f for this claim limitation. Petition, 84. As discussed above regarding claim limitation 7f, the asserted art does not render obvious this limitation. Dr. Viz, ¶164.

iii. Claim Limitation 18h

Petitioner relies solely on its discussion of claim 16 for this claim limitation. Petition, 84-85. As discussed above regarding claim 16, the asserted art does not render obvious this limitation. Dr. Viz, ¶165.

iv. Claim Limitation 18i

Petitioner relies solely on its discussion of limitation 1f for this claim limitation. Petition, 85. As discussed above regarding limitation 1f, the asserted art does not render obvious this limitation. Dr. Viz, ¶166.

v. Claim 19

Petitioner relies solely on its discussion of claim 26 for this claim. Petition, 86. For the reasons discussed above regarding claim 26, the asserted art does not render obvious this claim. Dr. Viz, ¶167.

For at least these reasons, the Petition does not establish a reasonable likelihood of prevailing on Ground 6.

I. Ground 7

Petitioner asserts that claims 21, 22, and 29 are obvious over Hart in view of the 1906 Cyclopedia, Wong, and Schuller. Petition, 87; Dr. Viz, ¶168. As set forth below, the Petition fails to establish a reasonable likelihood that the asserted art would render obvious any of claims 21, 22, or 29. *See id.* ¶168.

i. Claim 21

Petitioner relies on its discussion of claim 3 for this claim. Petition, 87. For the reasons discussed above, regarding claim 3, the asserted art does not render obvious this claim. Dr. Viz, ¶169.

The Petition and Dr. Ahmadian provide no rationale for why a POSITA would understand the pneumatic actuator would “need to be mounted in the machinery space.” Petition, 88; Ahmadian Decl., ¶117; Dr. Viz, ¶170. For example, Schuller

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mounts its pneumatic actuator at the end of its rail car, which decidedly does not have the claimed “machinery space.” Dr. Viz, ¶170.

Petitioner has not met its burden to show a reasonable likelihood that this claim is invalid. *See id.*, ¶¶169-171.

ii. Claim 22

Petitioner relies solely on its discussion of claim 23 for this claim. Petition, 88. For the reasons discussed above, regarding claim 23, the asserted art does not render obvious this claim. Dr. Viz, ¶172.

iii. Claim 29

Petitioner relies on its discussions of claims 21 and 22 for this claim. Petition, 88. For the reasons discussed above, regarding claims 21 and 22, the asserted art does not render obvious this claim. Dr. Viz, ¶173.

For at least these reasons, the Petition does not establish a reasonable likelihood of prevailing on Ground 7.

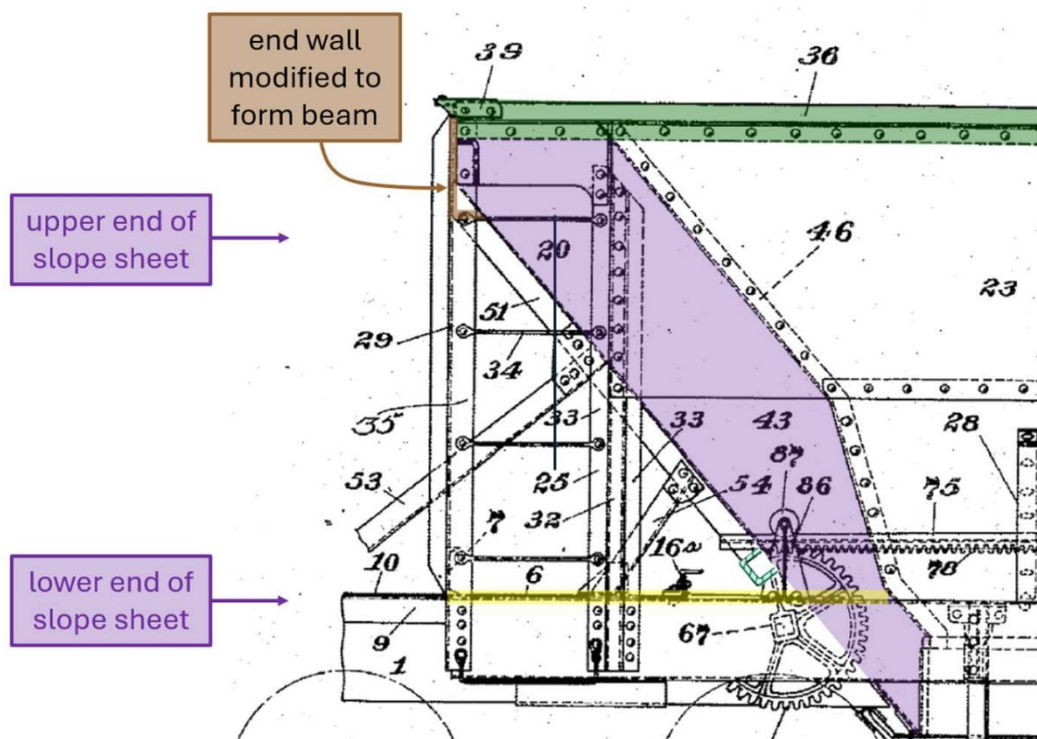
J. Ground 8

Petitioner contends that claims 32-34 are obvious over Lindström in view of Wong, Ratcliffe 1, and Hart. Petition, 89; Dr. Viz, ¶174. As set forth below, the Petition fails to establish a reasonable likelihood that the asserted art would render obvious any of claims 32-34. Dr. Viz, ¶174.

i. Claim Limitation 32g

As explained earlier, Wong is not concerned with holding heavy lading with a steel structure that will not bend or buckle from weight or impact, as is the case in Lindström. As a result, a POSITA would not look towards Wong to improve the end structure of Lindström. Dr. Viz, ¶175.

A POSITA would not have “slightly lengthened and bent” Lindström’s end wall based on Wong as proposed by the Petition. Petition, 95-97; Ahmadian Decl., ¶¶125-28; Dr. Viz, ¶176. The Petition does not explain, nor would it be clear to a POSITA, how this would have been accomplished given that outwardly extending stiffening flanges 51 appear to be directly in the way of the proposed modification:



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Petition, 107. Additionally, items 29, 53 and 54 would need to be changed or re-dimensioned according to Figure 2. Dr. Viz, ¶176.

A POSITA would not, and would not be motivated to, simply pick and choose pieces from the asserted art in the manner suggested by Petitioner and Dr. Ahmadian; nor would there be any reasonable expectation of success in any resultant modification. *Id.*, ¶177. Wong's end structure is a complex, interrelated structure that transfers forces through the structure, including the v-beams 36, thereby informing a POSITA not to take a single bent feature from that complex structure and incorporate it into Lindström, which uses a completely different structure based on struts 53 and 54. *Id.* Additionally, the proposed modification fails to take into consideration the other modifications Petitioner and Dr. Ahmadian propose making to Lindström in view of Ratcliffe 1 and Hart, or the impact or effect of those modifications taken together with incorporation of the bent feature in Lindström that Petitioner and Dr. Ahmadian propose. *Id.*

Petitioner has not met its burden to show a reasonable likelihood that this claim limitation is rendered obvious by the asserted art. *See id.*, ¶¶175-178.

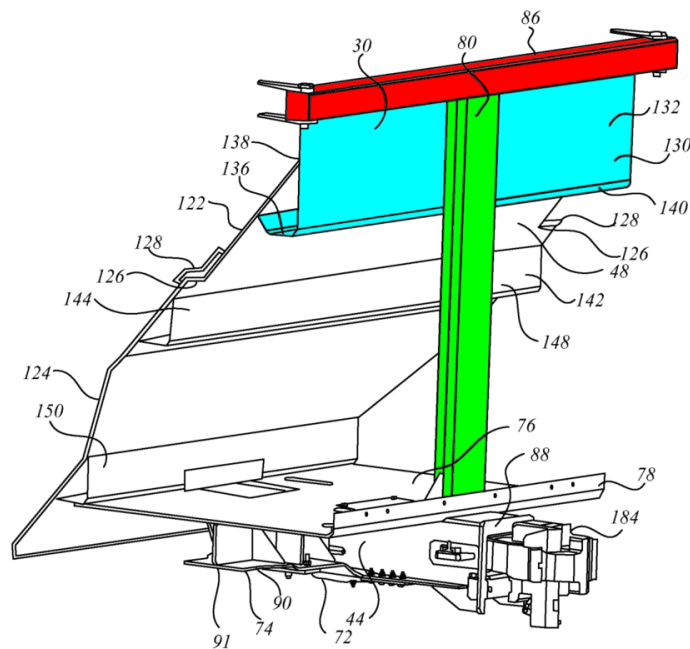
ii. Claim Limitation 32i

Petitioner proposes modifying “Lindström to incorporate an end post like the central end post in Ratcliffe 1.” Petition, 99. However, Ratcliffe 1 does not teach or suggest an “end post extending upwardly to meet said first beam and said top chord,”

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as recited in this claim limitation. Dr. Viz, ¶179. Thus, the modified version of Lindström proposed by Petitioner would not have an “end post extending upwardly to meet said first beam.” *Id.*, ¶180.

The '515 Patent explains that vertical leg 132 and bent flange 136 form a substantially triangular closed section defining a laterally extending end slope sheet reinforcement beam 140:

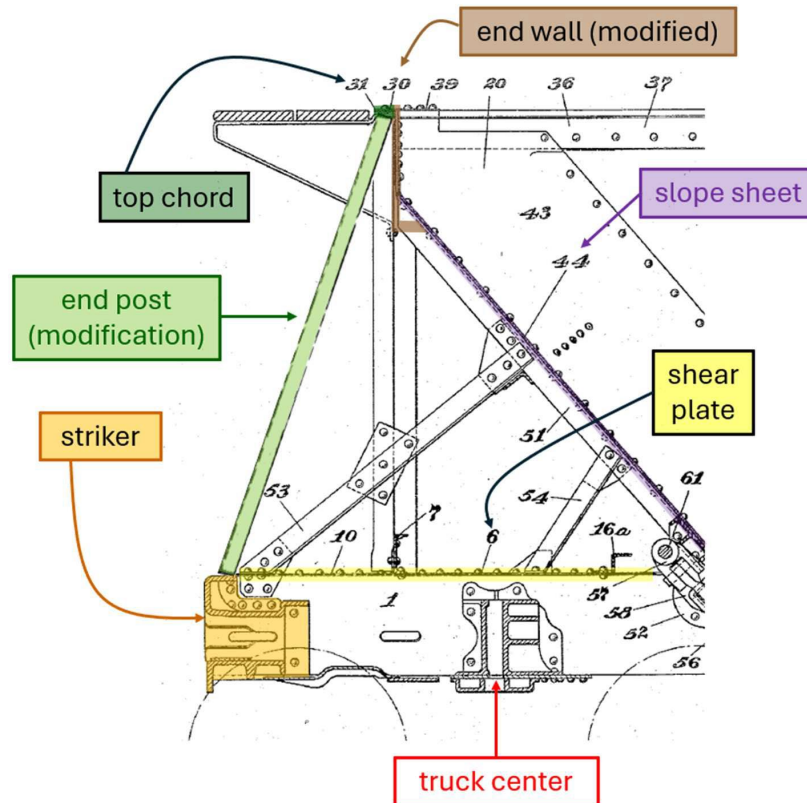


'515 Patent, Fig. 3a (annotated to highlight end post 80 in green, beam 140 in blue, and top chord 86 in red); *id.*, 16:41-53; Dr. Viz, ¶180. End post 80 is welded to vertical leg 132 of beam 140. '515 Patent, 16:52-53; Dr. Viz, ¶180.

The modified version of Lindström proposed by Petitioner would not have an “end post extending upwardly to meet said first beam.” *Id.*, ¶181. The structure that Petitioner identifies as an end post meets the structure that Petitioner identifies as a

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top chord and a closed portion of what Petitioner identifies as the end wall, not any structure that could be understood to correspond to the claimed first beam. *Id.* Petitioner does not address this issue. *Id.*; *see also* Petition, 98-100; Ahmadian Decl., ¶¶130-31.



Petition, 100; Dr. Viz, ¶181.

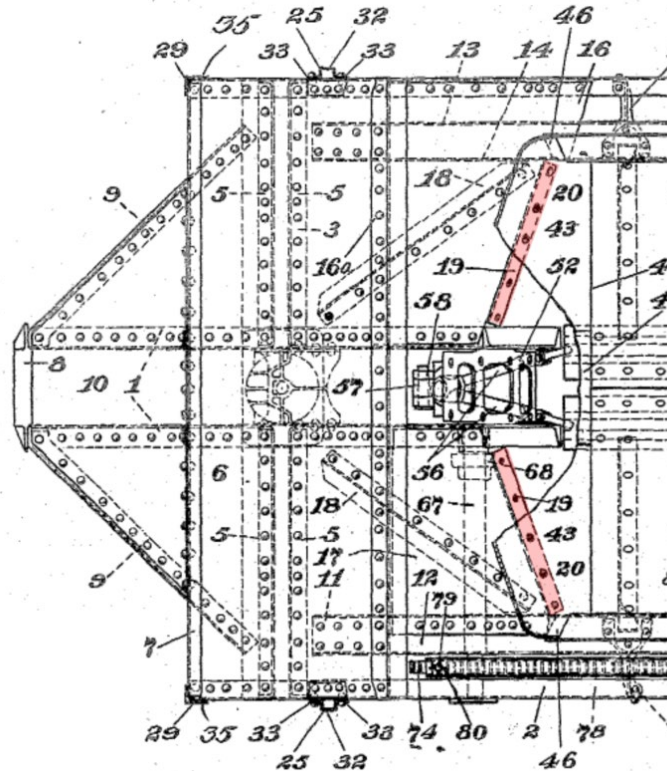
It is unclear why Petitioner makes this modification to Lindström since strut 53 is present in Lindström and prevents a combination where an end post could meet both the first beam and the top chord. Dr. Viz, ¶182. Moreover, the proposed end post added to Lindström does not run flush against the end wall nor is it connected to the end wall. *Id.*

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Petitioner has not met its burden to show a reasonable likelihood that this claim limitation is rendered obvious by the asserted art. *See id.* ¶¶179-183.

iii. Claim Limitation 32k

Petitioner picks the hollow beam b^4 from Hart to add into Lindström. Dr. Viz, ¶184. As recognized by Petitioner, the beam b^4 would need to be split to accommodate the structure of Lindström. Petition, 101-02 (“The beam could be formed of two parts and placed just longitudinally outboard of the flanges 19 that connect the slope sheet and the shear plate.”); Dr. Viz, ¶184. However, such a combination would not result in a “second beam extending cross-wise between said first and second side walls.” *Id.*, ¶184. Instead, as discussed by Petitioner, it would be only along flanges 19, which do not extend between the first and second side walls:



EX1005, Fig 3 (highlighting flanges 19 of the structure Petitioner identifies as the shear plate, longitudinally interior of where Petitioner would put the structure that Petitioner identifies as the second beam, in red); Dr. Viz, ¶184.

Petitioner has not met its burden to show a reasonable likelihood that this claim limitation, or claim 32 as a whole, is rendered obvious by the asserted art. *See id.*, ¶¶184-185.

iv. Claim 33

Petitioner proposes taking a third crosswise beam from Hart or Wong and incorporating it into Lindström. Dr. Viz, ¶186. For the reasons discussed above, with

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respect to claims 15 and 16, a POSITA would not look towards the structures of Hart or Wong, nor seek to combine them with Lindström. Dr. Viz, ¶186.

Petitioner and Dr. Ahmadian do not provide an explanation, or an illustration that would explain, how they propose to modify Lindström. *Id.* Instead, they show a modified version of Hart and cite to Wong. Petition, 103; Ahmadian Decl., ¶134; Dr. Viz, ¶186. It is unclear how they propose to modify, or where the modification would be made in, Lindström (or if a third beam would even fit). Dr. Viz, ¶186. Petitioner also does not explain why a POSITA would choose to incorporate a third beam in Lindström. *Id.* Petitioner's proposed modifications to the asserted art are unclear, and it is unclear from the proposed modifications how all the modifications to the asserted art would, or could, come together to arrive at a resultant rail car, much less the invention of claim 33. *Id.*

Petitioner has not met its burden to show a reasonable likelihood that this claim is invalid. *See id.* ¶¶186-187.

v. Claim 34

For the reasons discussed above, with respect to claims 15 and 16, a POSITA would not seek to combine Wong with Lindström. *See* Dr. Viz, ¶188.

Petitioner fails to explain how it proposes to modify that asserted art – for example, where in Lindström the proposed third beam would/could be placed, or that a third beam would even fit. Dr. Viz, ¶189. This conclusion cannot be made by

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looking at poor quality incomplete drawings and arcane descriptions. *Id.* The Petition and Dr. Ahmadian fail to provide any reasonable basis or rationale for modifying the asserted art in the manner they propose. For example, the Petition and Dr. Ahmadian do not explain why a POSITA would choose to incorporate the proposed third beam in Lindström. Petitioner, with no opinions from Dr. Ahmadian regarding this claim, does not describe or explain why the third beam added to Lindström would be mounted toes-in and define a hollow section. *Id.*

Petitioner has not met its burden to show a reasonable likelihood that this claim is invalid. *See id.* ¶¶188-190.

For at least these reasons, the Petition does not establish a reasonable likelihood of prevailing on Ground 8.

K. Ground 9

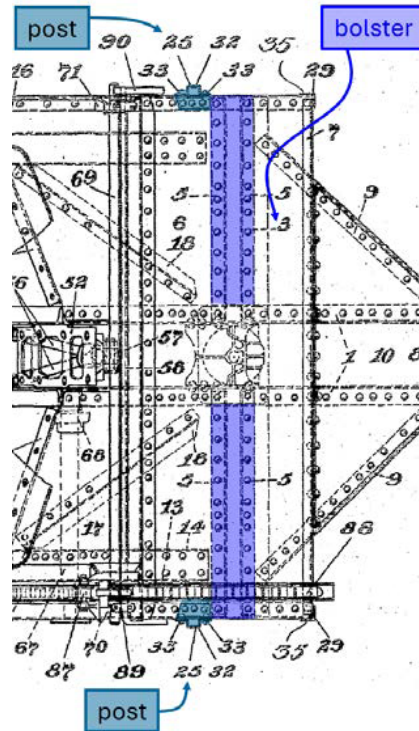
Petitioner contends that claims 35-44 are obvious over Lindström in view of Wong, Ratcliffe 1, Hart, and the 1946 Cyclopedia. Petition, 104; Dr. Viz, ¶191. As set forth below, the Petition fails to establish a reasonable likelihood that the asserted art renders obvious any of claims 35-44. Dr. Viz, ¶191.

i. Claim 35

Petitioner admits that Lindström's posts are "positioned immediately adjacent the bolster ends," not "mounted to said first and second ends of said main bolster

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and extend upwardly therefrom to meet said first end slope sheet” as the claim requires:



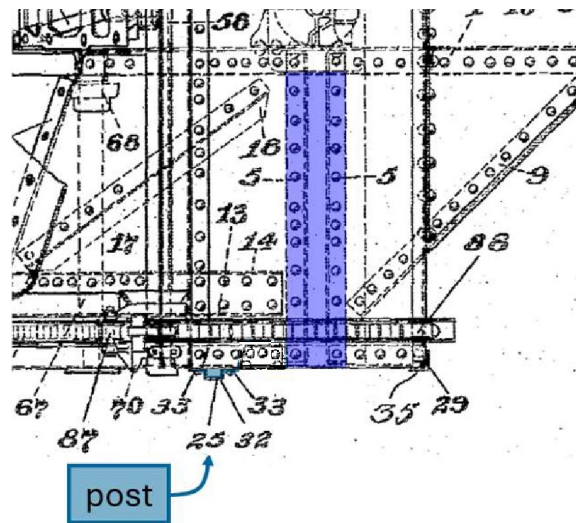
Petition, 104-05; Ahmadian Decl., ¶135; Dr. Viz, ¶192. It is unclear why Petitioner shaded the top of the sill behind the post 25 as being part of the post 25. Dr. Viz, ¶192. This appears to improperly suggest the post 25 is “adjacent” to the bolster, which it clearly is not. *Id.*

Petitioner suggests that a POSITA would understand that Lindström’s posts 25 “extend upwardly from the ends of the bolster.” Petition, 106; Dr. Viz, ¶193. However, Petitioner provides no support for this conclusory statement. Dr. Viz, ¶193. In fact, nothing in the ’515 Patent would suggest that a POSITA would consider Lindström’s posts as extending upwardly from the ends of the bolster. *Id.*

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Lindström's Figure 3 clearly shows that the structures identified by Petitioner as "corner posts" do not line up with the bolster, in contradiction to the explicit language of claim 35 and contrary to Dr. Ahmadian's position that "it would have been obvious ... to move Lindström's posts 25 slightly inward longitudinally." *Id.* Petitioner's proposed modification is neither obvious nor trivial as such a move upsets the load transfer between these members as intended by Lindström. *Id.* It is also unclear from the figures in Lindström if such an inward move could even be made without significantly changing the rest of the end of car structure. *Id.*

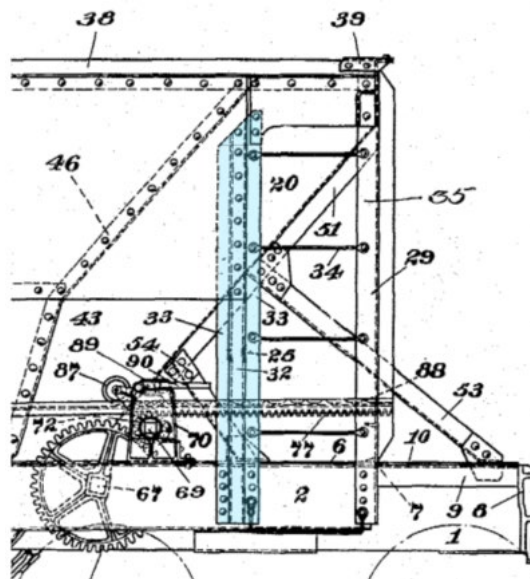
Recognizing the problem with Lindström, Petitioner suggests moving Lindström's posts "slightly inward longitudinally." Petition, 106. Such a modification would exacerbate the problem with Lindström, as shown below:



EX1005, Fig. 3 (modified); Dr. Viz, ¶194.

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To the extent that Petitioner intended to suggest mounting the post over the bolster, it provides no motivation to make this change based on Hart or any of the other asserted art. Dr. Viz, ¶195. A POSITA would not seek to make this modification because it would reduce the width of Lindström's ladder, which would make it difficult and dangerous to use, and would likely run afoul of safety regulations and conventions setting minimum ladder widths:



EX1005, Fig. 2 (annotated to highlight post 25); Dr. Viz, ¶195.

Petitioner has not met its burden to show a reasonable likelihood that this claim is invalid. *See id.*, ¶¶192-196.

ii. Claim 37

Petitioner contends that Lindström discloses the claimed aperture. Dr. Viz, ¶197. However, as discussed above, with respect to claim 23, Petitioner is incorrect

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in its assumption that a POSITA would understand the corner post to be part of the sidewall. *Id.* Thus, Lindström does not disclose the claimed aperture. *See id.*

Petitioner has not met its burden to show a reasonable likelihood that this claim is invalid. *See id.*, ¶¶197-198.

iii. Claim 38

Petitioner relies solely on its discussion of claim 37 for this claim. Petition, 110. For the reasons discussed above, regarding claim 37, the asserted art does not render obvious this claim. Dr. Viz, ¶199.

Petitioner also does not explain why or how in the asserted art “said main bolster has first and second ends; and respective first and second corner posts are mounted to said first and second ends of said main bolster and extend upwardly therefrom.” *Id.* ¶200. For the reasons discussed above, with respect to claim 35, it does not. *See* Section VI.K.i; *see also* Dr. Viz, ¶200.

Petitioner has not met its burden to show a reasonable likelihood that this claim is invalid. *See* Dr. Viz, ¶¶199-201.

iv. Claim 39

Petitioner suggests modifying Lindström to have the 1946 NSC ore car's striker length. Petition, 111. A POSITA would not seek to modify Lindström to have the specific distance between NSC ore car's striker and truck center. Dr. Viz, ¶202.

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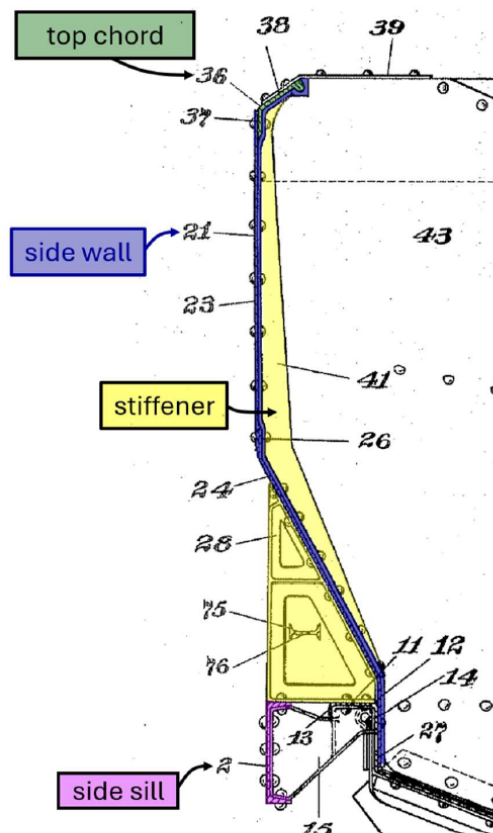
Contrary to Dr. Ahmadian's position in ¶¶145-146 of the Ahmadian Decl., "making necessary adjustments" to force this dimension to either be a certain value (like from the NSC ore car) or to be less than 50 inches as defined in claim 39 is neither a "routine design choice" nor would it be a trivial exercise. Dr. Viz, ¶202. The distance between the striker and centerline of the truck affects railcar curve negotiation. *Id.* The centerline of the truck also must coincide with the centerline of the body bolster, which is not easy to move unless the entire length dimension of the railcar can be altered without other issues arising. *Id.* Petitioner's proposed modification is hand-waving at best, and no POSITA would do as Petitioner suggests. *Id.*

First, the designs of the Lindström and the NSC ore car's end sections are completely different, with Lindström's tapering out to the end and the NSC ore car having a boxed end. Dr. Viz, ¶203. Second, Petitioner overlooks the significant adjustments that would need to be made to modify Lindström to include the NSC ore car's dimensions. *Id.* Lindström uses a much longer end section than the NSC ore car, presumably to accommodate strut 53 whose bottom end connects near the end of the car. *Id.* Moreover, the '515 Patent calls out the "abnormally short distance[s] from the striker 88 to the truck center," informing a POSITA that it is not the "routine design choice" asserted by Petitioner. *Id.*

Petitioner has not met its burden to show a reasonable likelihood that this claim is invalid. Dr. Viz, ¶¶202-204.

v. Claim Limitation 40b

The Petition does not establish, and does not provide any reasonable basis to conclude, that the claimed “first side wall extends from said side sill to said top chord” is taught by Lindström. Dr. Viz, ¶205. Instead, as shown in the figures depicted in and relied on by the Petition, the structure that the Petition identifies as the sidewall in the asserted art never meets the structure it identifies as the side sill:



Lindström Fig. 5

Lindström, Fig. 5 (annotated); Dr. Viz, ¶205.

Petitioner has not met its burden to show a reasonable likelihood that this claim is invalid. Dr. Viz, ¶¶205-06.

vi. Claim Limitation 40h

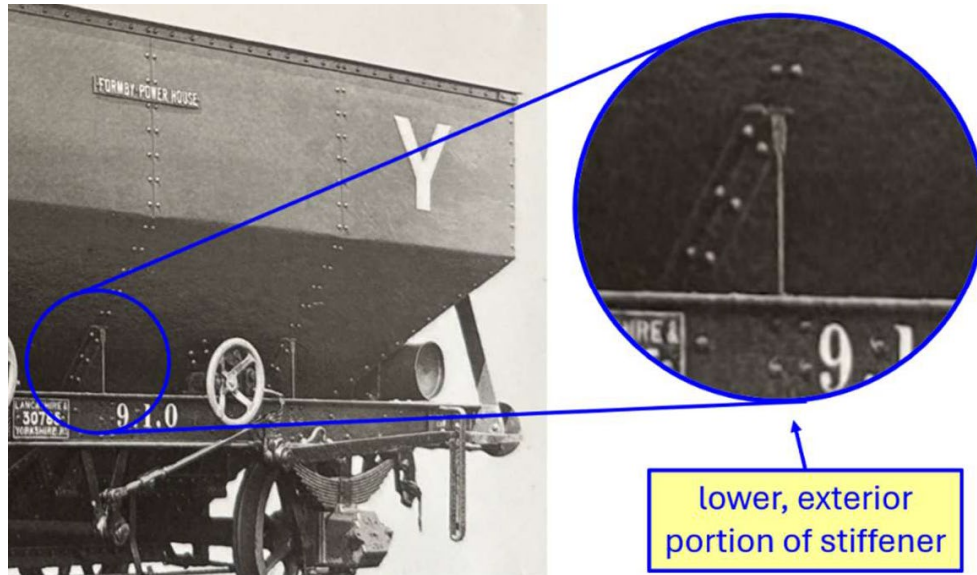
The Petition appears to assert, without any support, that “web continuity” only requires that claim elements be “in the same vertical plane.” Dr. Viz, ¶207.

The sidewall stiffening elements from Lindström and the NSC ore cars do not have webs. Dr. Viz, ¶208. The drawings for the NSC ore cars appear to have sections that are fastened to the side wall. *Id.* There is no disclosure of web continuity between a flange and a web that is perpendicular to the flange that would be considered a side sheet of the car. *Id.*; see '515 Patent, 15:59-62 (“In this arrangement, the vertical stiffener, 102, acts as the web of a T-section, and the local region of the wall section to which it is joined functions as the flange of that T-section.”). A POSITA would not conclude that what is shown in the drawings relied on by Petitioner is the same thing as what is claimed in the '515 Patent.

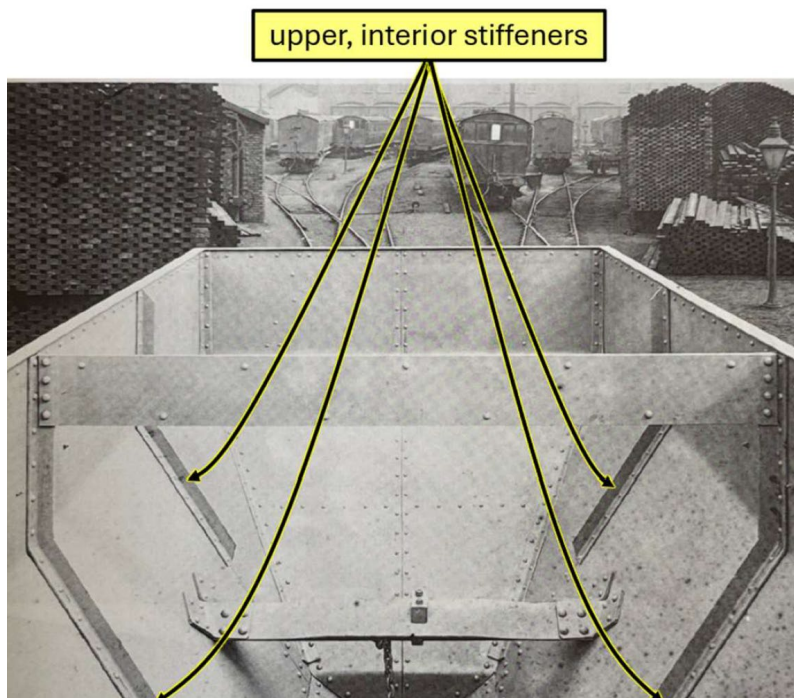
The '515 Patent teaches that the web of the stiffener is matched to the side wall as if the side wall were the flange of an I-beam. Dr. Viz, ¶208. Even if a POSITA could reconstruct the drawings in the asserted art, the web continuity of the I-beam formation feature of the '515 Patent differentiates the claims over that asserted art which utilized L-brackets for securing the lower portion of the stiffener to the side wall and includes a single L-bracket on the interior with no discernible sidewall stiffener. *See id.*

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The L&Y Ore Car described in Coates shows an example of the same general type of L-brackets used in the drawings relied on by Petitioner:



Dr. Viz, ¶209.



Dr. Viz, ¶209.

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The Petition fails to present any asserted art that teaches, suggests, or would have rendered obvious the claimed “sidewall stiffener having web continuity” together with the remaining elements and limitations in any one of the challenged claims. *See* Dr. Viz, ¶210.

Petitioner has not met its burden to show a reasonable likelihood that this claim is invalid. *See id.* ¶¶207-211.

vii. Claim 41

Petitioner relies on Lindström for this claim, however, it appears that Petitioner explicitly doubted that Lindstrom’s side wall stiffeners are substantially co-planar and vertically aligned in its discussion of claim limitation 40h. Dr. Viz, ¶212. Because Petitioner has not established, and a POSITA would not have any reasonable basis to conclude, that Lindström teaches or suggests substantially co-planar and vertically aligned sidewall stiffeners, there is no reasonable basis to conclude that Lindström, alone or in any of the proposed combinations, teaches this claim limitation. *Id.*, ¶213.

Petitioner has not met its burden to show a reasonable likelihood that this claim is invalid. *See id.*, ¶¶212-214.

viii. Claim 42

For the reasons discussed above, with respect to claim 40 (Section VI.K.vi), the Petition never establishes, and a POSITA would have no reasonable basis to conclude, that the structures in Lindström that Petitioner identifies as sidewall stiffeners have “webs.” Dr. Viz, ¶215.

Petitioner has not met its burden to show a reasonable likelihood that this claim is invalid. *See id.*, ¶¶215-216.

ix. Claim 43

A POSITA would understand that the claimed sloped side sheet would be a separate feature from the claimed side wall. Dr. Viz, ¶217. As discussed in the '515 Patent, “The upper margin of the side slope sheet 50 of the hopper discharge section is welded to the lower margin of the inclined or sloped portion 98, such that the structure presents a continuous sloped surface for containing, and then slidingly discharging, particulate lading.” *See* '515 Patent, 15:51-55; Dr. Viz, ¶217.

This understanding is confirmed by Figs. 2b and 3b of the '515 Patent (reproduced below with annotations). Dr. Viz, ¶218. Figure 2b is a view of the sidewall of the railcar from the outside, and shows the bottom flange 100 of the side sheet (shown in light blue) in line with the apertures 114 (red):

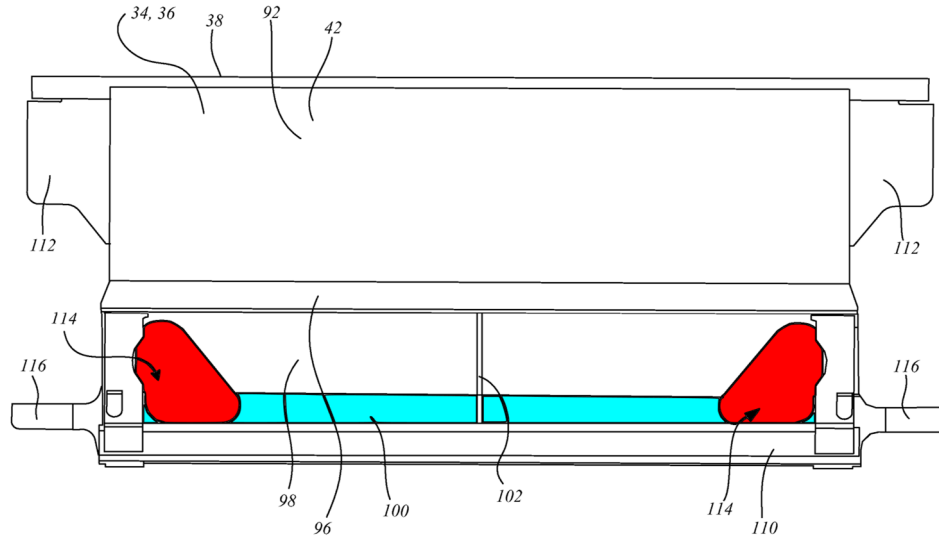


Figure 2b

'515 Patent, Figs. 2b, (showing bottom flange 100 in blue and apertures 114 in red);
Dr. Viz, ¶218.

Figure 3b is a cross-sectional view through the middle of the railcar and shows
side slope sheet 50 (shown in green), with aperture 114 (red):

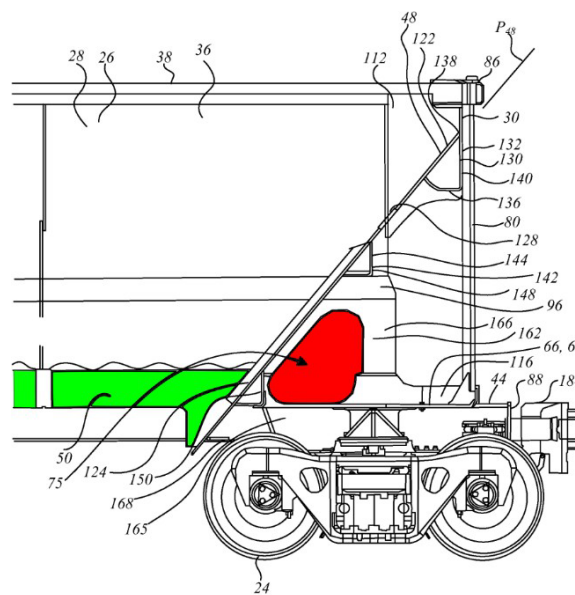


Figure 3b

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'515 Patent, Figs. 3b, (showing side slope sheet 50 in green, apertures 114, annotated in red); Dr. Viz, ¶218. As seen by comparing Figure 2b and 3b, the upper margin of the bottom flange 100 in Figure 2b is at the same height as the upper margin of the side slope sheet 50 in Figure 3b because both are at the same height when compared to aperture 114 (annotated in red). *Id.* This is consistent with the placement of the side slope sheet as shown in modified Figure 2c:

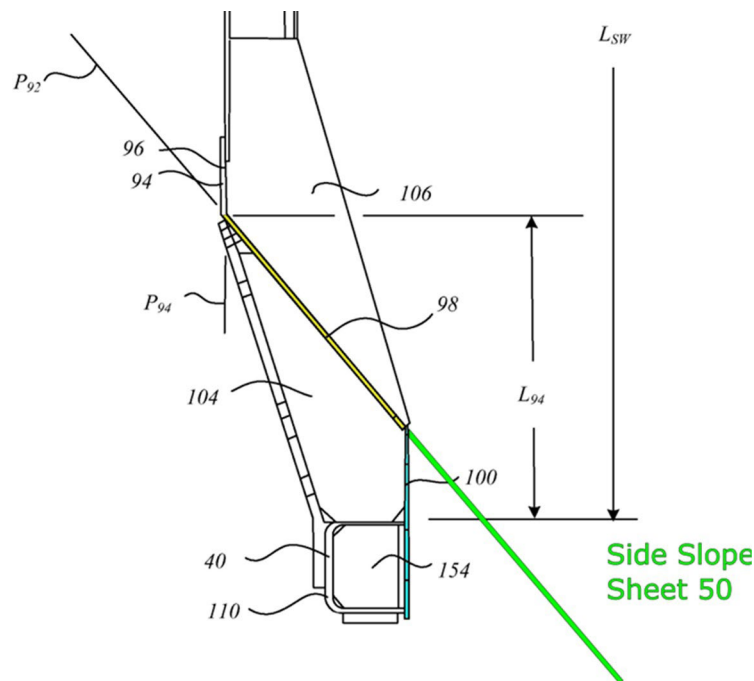


Figure 2c

'515 Patent, Fig. 2c (portion of figure showing side slope sheet annotated in green, bottom flange 100 annotated in blue, and sloped portion 98 annotated in yellow); Dr. Viz, ¶218.

However, under Petitioner's interpretation, the claimed "sloped side sheet" is the same as the claimed "transition portion." *Id.*, ¶219. The "sloped side sheet" cannot be the same physical structure as the "transition portion" because the "first

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sloped side sheet” cannot “meet” the “first sidewall at said transition portion” – they are one and the same. *Id.*

Petitioner has not met its burden to show a reasonable likelihood that this claim is invalid. *See id.*, ¶¶217-220.

x. Claim 44

Patent drawings are not to be relied on as being to scale unless otherwise indicated in the specification. There is no such indication in Lindström. Dr. Viz, ¶221. Petitioner errs in adopting dimensions from Lindström as if it was to scale. *Id.*

Dr. Ahmadian states that “it would have been obvious to select dimensions consistent with the Lindström’s drawings and with the NSC ore car for the additional reason that the precise dimensions are a matter of design choice.” Ahmadian Decl. ¶154; Dr. Viz, ¶222. A POSITA would not make such wholesale modifications to a rail car to obtain the claimed dimensions. Dr. Viz, ¶223. Dr. Ahmadian fails to explain how having the claimed dimensions maximizes the design constraints he discusses, or that Lindström’s sloped sheets are at different angles than the 1946 NSC ore car’s. *Id.*

Petitioner has not met its burden to show a reasonable likelihood that this claim is invalid. *See id.* ¶¶221-224.

For at least these reasons, the Petition does not establish a reasonable likelihood of prevailing on Ground 9.

VII. Conclusion

For the foregoing reasons, institution should be denied.

Respectfully Submitted,

Date: September 18, 2025

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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 13,815 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, and certificate of word count.

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IPR2025-01047

PATENT OWNER'S PRELIMINARY RESPONSE
CERTIFICATE OF SERVICE

The undersigned hereby certifies that the foregoing **PATENT OWNER'S PRELIMINARY RESPONSE** was served electronically in its entirety on the date noted below via electronic mail to the following attorneys of record:

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