

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

FREIGHTCAR AMERICA, INC.,
Petitioner,

v.

NATIONAL STEEL CAR LIMITED,
Patent Owner.

IPR2025-01047
Patent 8,132,515 B2

Before HYUN J. JUNG, NEIL T. POWELL, and
RICHARD H. MARSCHALL, *Administrative Patent Judges*.

JUNG, *Administrative Patent Judge*.

DECISION
Granting Institution of *Inter Partes* Review
35 U.S.C. § 314

I. INTRODUCTION

A. Background and Summary

FreightCar America, Inc. (“Petitioner”) filed a Petition (Paper 1, “Pet.”) requesting institution of an *inter partes* review of claims 1–44 of U.S. Patent No. 8,132,515 B2 (Ex. 1001, “the ’515 patent”). National Steel Car Limited (“Patent Owner”) filed a Preliminary Response. Paper 12 (“Prelim. Resp.”). With our authorization, Petitioner filed a Reply to Patent Owner’s Preliminary Response (Paper 18), and Patent Owner filed a Preliminary Sur-reply (Paper 22).

Under 35 U.S.C. § 314 (2024), an *inter partes* review may not be instituted “unless . . . there is a reasonable likelihood that the petitioner would prevail with respect to at least 1 of the claims challenged in the petition.” Upon consideration of the Petition and for the reasons explained below, we determine that Petitioner has shown a reasonable likelihood of prevailing with respect to at least one of the challenged claims.

Thus, we institute an *inter partes* review of claims 1–44 of the ’515 patent on all presented challenges. 37 C.F.R. § 42.108(a) (2024) (“When instituting . . . review, the Board will authorize the review to proceed on all of the challenged claims and on all grounds of unpatentability asserted for each claim.”); *see also SAS Inst. Inc. v. Iancu*, 138 S. Ct. 1348, 1359–60 (2018).

B. Real Parties in Interest

Petitioner identifies FreightCar America, Inc., FreightCar North America, LLC, JAC Operations Inc., and FCA-FASEMEX, LLC as real parties in interest. Pet. 124. Patent Owner identifies itself as a real party in interest. Paper 4, 2.

C. Related Matters

The parties identify *National Steel Car Limited v. FreightCar America, Inc.*, 1:24-cv-00594-JLH (D. Del.) as a related matter. Pet. 124; Paper 4, 2. Patent Owner also identifies IPR2025-01046 and IPR2025-01048. *Id.*

D. The '515 Patent (Ex. 1001)

The '515 patent issued on March 13, 2012 from an application filed on June 16, 2010 that is a division of an application filed on September 14, 2009 and claims priority to a foreign application filed on September 14, 2009. Ex. 1001, codes (22), (30), (45), (62), 1:4–14. Reproduced below is Figure 1 of the '515 patent.

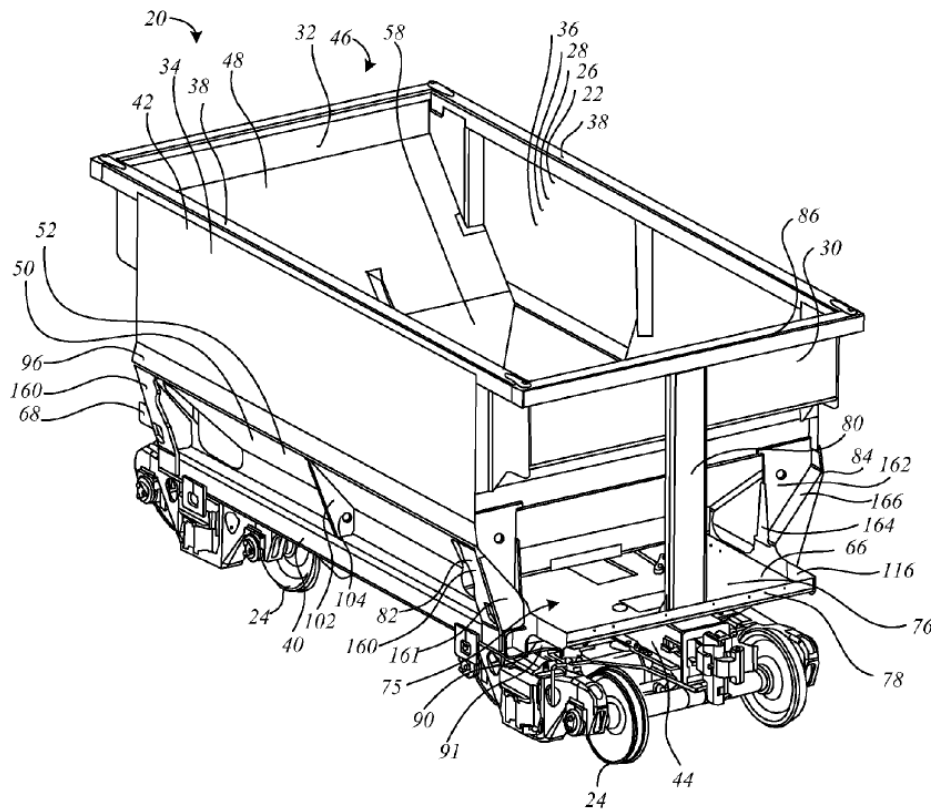


Figure 1

Figure 1 shows an “isometric view of a railroad freight car . . . with all ancillary systems removed to leave only primary structure visible.”

Ex. 1001, 10:48–51. Railroad freight car 20, as an example, can be “a flow through car, in which lading is introduced by gravity flow from above, and removed by gravity discharge through gated or valved outlets below.” *Id.* at 12:37–42.

Car 20 can have car body 22 and lading containment vessel or shell 26 that includes end walls 30, 32 and side walls 34, 36 to define a generally rectangular wall structure 28. Ex. 1001, 12:55–56, 13:4–10. Lading containment vessel 26 “is in the nature of hopper 52.” *Id.* at 13:55–56. Hopper 52 has “upper portion 58 with substantially vertical wall panels, and a lower stationary portion defined by a set of converging sloped walls,” specifically end sheets 48 and side sheets 50. *Id.* at 13:57–60. Door assembly 56 is “[a]t the lower margin of the sloped walls.” *Id.* at 13:60–61.

Reproduced below is Figure 3a of the '515 patent.

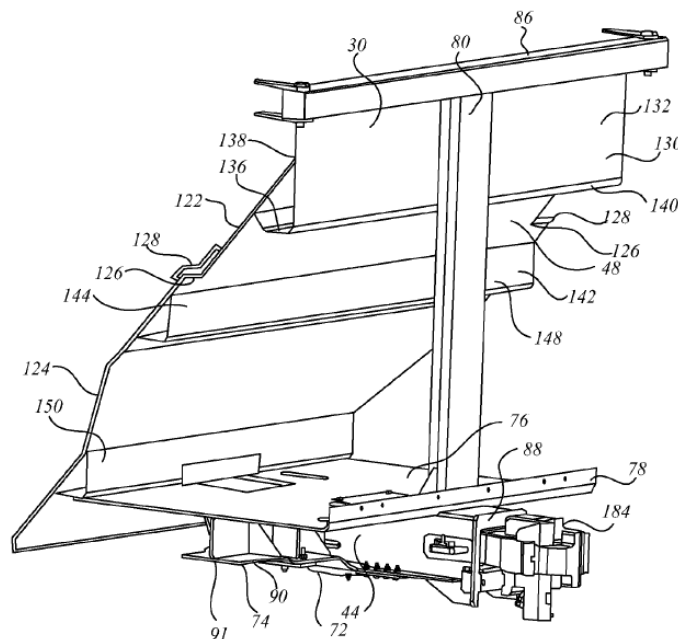


Figure 3a

“Figure 3a shows a perspective view of the end structure of the railroad freight car” shown in Figure 1. Ex. 1001, 10:56–57. Containment

vessel 26 sits on first and second “[e]nd structures 66, 68 [that] are in turn carried by trucks 24.” *Id.* at 13:63–66. “[T]rucks 24 are most immediately surmounted by center plates 72 of longitudinally extending stub sills 44.” *Id.* at 14:4–6. “Stub sills 44 in turn carry laterally extending main bolster arms 74 of main bolster 90.” *Id.* at 14:6–7. Side sills 40 “tie together, the most laterally outboard extremities of main bolster arms 74.” *Id.* at 14:9–12.

Shear plate 76 is mounted to define a top cover plate of stub sill 44 and extends laterally between side sills 40 and between end slope sheet 48 to end sill 78. Ex. 1001, 14:12–16. Side sills 40 run fore-and-aft along lower portions of side walls 34, 36. *Id.* at 13:12–14. Car 20 can also include end post 80 and a pair of side or corner posts 82, 84. *Id.* at 14:18–20. “End post 80 is rooted in shear plate 76 in line with center sill 44” and “extends fully between shear plate 76 and top chord 86 of end wall 30 or 32.” *Id.* at 14:21–25. Corner posts 82, 84 “are rooted to, and stand upwardly from” where the laterally outboard ends of main bolster arms 74 meet side sills 40 and “extend upwardly from this junction to mate with various elements of the end and side walls.” *Id.* at 14:26–30.

“Car 20 has an end of car machinery space, indicated generally as 75, that is bounded by shear plate 76 on the bottom, the sloped end wall assembly 30 or 32 of the car on the top, main vertical central end post 80, and main side posts 82, 84 at the ends of main bolster 90.” Ex. 1001, 14:43–47, Fig. 3b. Machinery space 75 “is substantially unobstructed by the primary structure of the car.” *Id.* at 14:47–50.

E. Illustrative Claim

The ’515 patent includes 44 claims, all of which Petitioner challenges. Claims 1, 7, 18, 20, 24, and 32 are independent, and reproduced below is claim 1.

1. 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;

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

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;

said first end slope sheet of said hopper over hanging said shear plate of said first end section; and

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;

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;

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;

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

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.

Ex. 1001, 23:8–56.

F. Asserted Prior Art and Proffered Testimonial Evidence

Petitioner identifies the following references as prior art in the asserted grounds of unpatentability:

Name	Reference	Exhibit
Hart	US 992,192, issued May 16, 1911	1008
Lindström	US 1,321,928, issued Nov. 18, 1919	1005
Campbell '051	US 1,537,051, issued May 5, 1925	1012
Campbell '652	US 1,999,652, issued Apr. 30, 1935	1013
Schuller	US 3,710,729, issued Jan. 16, 1973	1014
Wong	US 4,941,411, issued July 17, 1990	1006
1906 Cyclopedia	Rodney Hitt, The Car Builders' Dictionary, (The Railroad Gazette ed., 5th ed., 1906)	1009
1946 Cyclopedia	1946 Car Builders' Cyclopedia, (Roy V. Wright ed., 17th ed., 1946)	1004
Ratcliffe 1	David Ratcliffe, Modern Private Owner Wagons on British Rail (1989)	1017
Karig	Martin Robert Karig III, Coal Cars: The First Three Hundred Years (2007)	1016

Petitioner contends that the above-listed references qualify as prior art under at least § 102(b).¹ Pet. 30–31 (citing Ex. 1022). Petitioner also relies on a Declaration of Dr. Mehdi Ahmadian. Pet. 29; Ex. 1003. Patent Owner provides a Declaration of Mark J. Viz, Ph.D., P.E. (Ex. 2035).

¹ The relevant sections of the Leahy-Smith America Invents Act (“AIA”), Pub. L. No. 112–29, 125 Stat. 284 (Sept. 16, 2011), took effect on March 16, 2013. Because the '515 patent claims priority to an application filed before that date, our citations to 35 U.S.C. §§ 102 and 103 in this Decision are to their pre-AIA versions. *See also* Pet. 21 (assuming for the Petition that September 11, 2009 is the priority date).

G. Asserted Grounds

Petitioner asserts that claims 1–44 are unpatentable on the following grounds:

Claims Challenged	35 U.S.C. §	References/Basis
1, 2	103(a)	Hart, 1906 Cyclopedia
3	103(a)	Hart, 1906 Cyclopedia, Schuller
4	103(a)	Hart, 1906 Cyclopedia, Schuller, Karig
5, 6	103(a)	Hart, 1906 Cyclopedia, Campbell '652
7–16, 20, 23, 24–28, 30, 31	103(a)	Hart, 1906 Cyclopedia, Wong
17–19	103(a)	Hart, 1906 Cyclopedia, Wong, Campbell '051
21, 22, 29	103(a)	Hart, 1906 Cyclopedia, Wong, Schuller
32–34	103(a)	Lindström, Wong, Ratcliffe 1, Hart
35–44	103(a)	Lindström, Wong, Ratcliffe 1, Hart, 1946 Cyclopedia

Pet. 19.

II. ANALYSIS

A. Legal Standards

“In an [*inter partes* review], the petitioner has the burden from the onset to show with particularity why the patent [claim] it challenges is unpatentable.” *Harmonic Inc. v. Avid Tech., Inc.*, 815 F.3d 1356, 1363 (Fed. Cir. 2016). This burden of persuasion never shifts to Patent Owner. *Dynamic Drinkware, LLC v. Nat’l Graphics, Inc.*, 800 F.3d 1375, 1378 (Fed. Cir. 2015). The Board may authorize an *inter partes* review if we determine that the information presented in the Petition shows that there is a reasonable likelihood that Petitioner will prevail with respect to at least one of the claims challenged in the petition. 35 U.S.C. § 314(a).

Petitioner contends that the challenged claims of the '515 patent are unpatentable under § 103. Pet. 19, 30. A claim is unpatentable under § 103 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 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) where in evidence, so-called secondary considerations. *Graham v. John Deere Co. of Kan. City*, 383 U.S. 1, 17–18 (1966). When evaluating a combination of teachings, we must also “determine whether there was an apparent reason to combine the known elements in the fashion claimed by the patent at issue.” *KSR*, 550 U.S. at 418 (citing *In re Kahn*, 441 F.3d 977, 988 (Fed. Cir. 2006)).

B. Level of Ordinary Skill in the Art

Petitioner contends that a person of ordinary skill in the art “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.” Pet. 29 (citing Ex. 1003 ¶¶ 42–46).

Patent Owner responds that Petitioner’s proposed level of ordinary skill in the art 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.” Prelim. Resp. 9 (citing Ex. 2035 ¶¶ 33–40). According to Patent Owner, a person of ordinary skill in the art “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.” *Id.* (citing Ex. 2035 ¶ 35).

The parties agree that one of ordinary skill in the art “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.” Pet. 29; Prelim. Resp. 9. Patent Owner, however, disagrees that the experience should include designing or analyzing “similar vehicles.” Prelim. Resp. 9.

At this stage, for the reasons below, limiting the ordinary skill in the art to “at least two years of experience designing or analyzing rail cars” does not affect our analysis of the parties’ dispute or our determination that there is a reasonable likelihood that Petitioner would prevail with respect to at least one of the challenged claims. Thus, based on the preliminary record, we adopt Petitioner’s proposed level of ordinary skill to determine whether review should be instituted.

Patent Owner also argues that Petitioner’s declarant does not have “actual industry experience with railcar structures” and, thus, “makes the wrong conclusions and conflates various concepts that a [person of ordinary skill in the art] with practical industry experience and knowledge of rail cars would not.” Prelim. Resp. 9–10 (citing Ex. 2035 ¶ 35). For the reasons discussed below, in our preliminary analysis, we give credit to the cited testimony of Petitioner’s declarant, because it finds support in the relied-upon portions of the record.

C. Claim Construction

In an *inter partes* review, the claims are construed using the same claim construction standard that would be used to construe the claim in a civil action under 35 U.S.C. [§] 282(b),

including construing the claim in accordance with the ordinary and customary meaning of such claim as understood by one of ordinary skill in the art and the prosecution history pertaining to the patent.

37 C.F.R. § 42.100(b); *see Phillips v. AWH Corp.*, 415 F.3d 1303, 1312–13 (Fed. Cir. 2005) (en banc).

Petitioner proposes no interpretation for any claim term and contends that “[m]ost claim terms are conventional names for standard rail-car features.” Pet. 29. Petitioner also argues that “[t]he challenged claims are unpatentable under any reasonable construction.” *Id.*

Patent Owner responds that, for its Preliminary Response, no construction is required to deny institution. Prelim. Resp. 11. Patent Owner contends ordinary and customary meaning in view of the Specification and prosecution history is sufficient. *Id.*

At this stage, we do not need to construe expressly any term to determine whether to institute review. *Realtime Data, LLC v. Iancu*, 912 F.3d 1368, 1375 (Fed. Cir. 2019) (“The Board is required to construe ‘only those terms that . . . are in controversy, and only to the extent necessary to resolve the controversy.’”) (quoting *Vivid Techs., Inc. v. Am. Sci. & Eng’g, Inc.*, 200 F.3d 795, 803 (Fed. Cir. 1999)).

Patent Owner also responds that Petitioner “does not advance any claim constructions” but “takes numerous stances on claim construction and what claim terms should mean, sometimes leading to inconsistent positions.” Prelim. Resp. 10 (citing Pet. 29). Patent Owner argues that Petitioner fails to justify such claim constructions and, thus, fails to show with particularity that the asserted grounds meet the challenged claims. *Id.* at 10–11. According to Patent Owner, the Petition should be denied, because it fails to

comply with 35 U.S.C. § 322(a)(3) and 37 C.F.R. § 42.204(b)(3)-(4). *Id.* at 11.

In its challenges, Petitioner expressly argues with citations to the '515 patent that its Specification provides a definition or that the claims encompass, at least, the one embodiment described by the '515 patent. *See, e.g.*, Pet. 34 (“The '515 patent expressly defines ‘draft sill.’”), 37 (“Because limitation [1e] should be interpreted to cover the only embodiment in the '515 patent, the reinforcement beams shown in Fig. 3a do not constitute “primary structure” prohibited by limitation [1e].”), 49–50 (“If claim 1 is construed to cover the preferred embodiment, as it should be, then a machinery space is free of primary structure even if primary structure at the perimeter of the machinery space extends a *de minimis* amount into that space.”). Based on the record at this preliminary stage, Petitioner sufficiently explains why terms have defined meanings or why the claims encompass the one described embodiment.

Thus, we do not agree with Patent Owner that Petitioner fails to justify its claim construction positions or that the Petition should be denied under 35 U.S.C. § 322(a)(3) and 37 C.F.R. § 42.204(b)(3)–(4). Prelim. Resp. 10, 11.

D. Asserted Obviousness of Independent Claim 24

1. Hart (Ex. 1008)

Hart “relates to dump cars,” particularly those known as Hart convertible cars, “in which provision is made for the efficient and rapid unloading of the car.” Ex. 1008, 1:9–14. Reproduced below is Figure 1 of Hart.

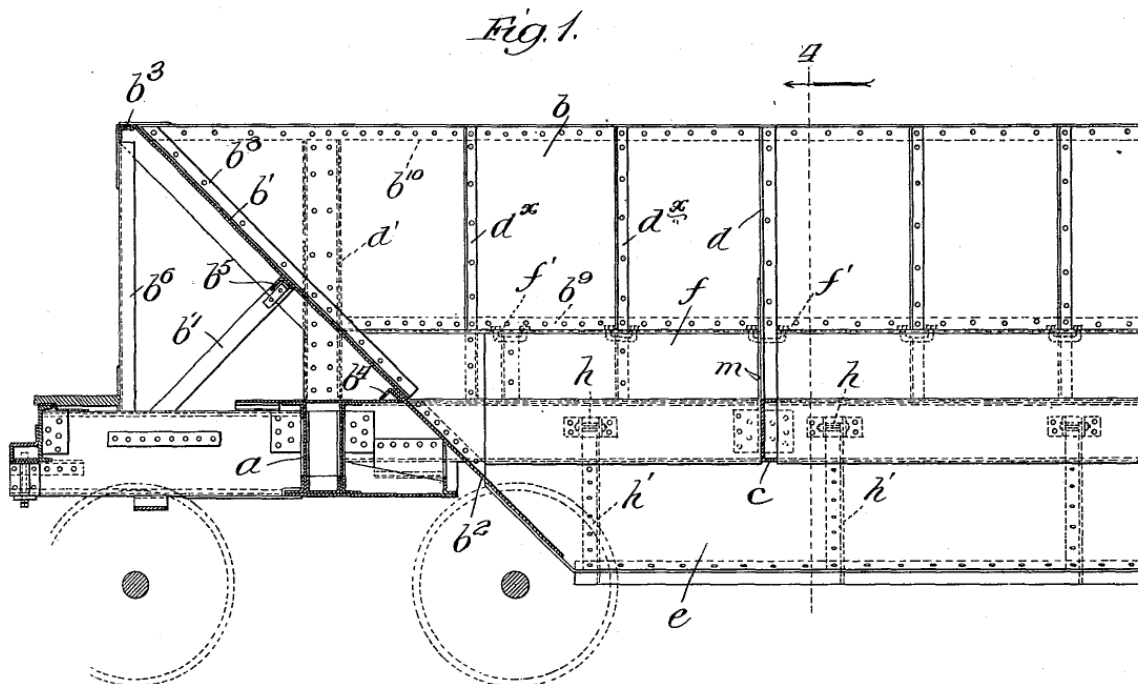


Figure 1 shows “a longitudinal elevation, partly in section,” of Hart’s car. Ex. 1008, 1:17–19. The car has an underframe comprising bolsters *a* and intermediate cross members *c*, both of which are connected to longitudinal sills *c*². *Id.* at 1:29–34. “Suitably secured to the bolsters at each side of the car are posts or stakes *d*” that “extend[] downwardly below the level of the transverse members” and “are suitable connected to the transverse members of the underframe.” *Id.* at 1:34–35, 1:45–50, Fig. 4. Secured to the posts are plate girder sides *b* with lower longitudinal member *b*⁹ and upper member *b*¹⁰. *Id.* at 1:37–40.

“[U]pper member *b*¹⁰ of the plate girder side extends beyond the end of the supporting post *d*’ and has connected to its outer end a support *b*⁶.” Ex. 1008, 1:92–95. “[S]upport *b*⁶ [is] in turn connected to a short side sill *b*²⁰ extending from the bolster toward the end of the car, and the end sill *c*³ is in turn connected to the short side sills.” *Id.* at 1:95–99. “Suitable draft beams *c*⁴ are connected to the end sill and to the bolster.” *Id.* at 1:101–103.

According to Hart, “*b*’ represents the inclined ends of the car.”
Ex. 1008, 2:46–47. The “ends of the car [are] suitably supported by upper and lower transverse brace members *b*³ and *b*⁴, respectively, the upper brace member being supported from the sides of the car and suitably braced by an upright *b*⁶.” *Id.* at 2:48–53. “The lower portion of the end of the car is secured to a transverse member *b*⁴, which also serves to support the upper portion of the end of the hopper.” *Id.* at 2:53–57. “Transverse braces *b*⁵ and inclined brace *b*⁷ serve to further strengthen the ends of the car.” *Id.* at 2:57–59.

2. *The 1906 Cyclopedia (Ex. 1009)*

The 1906 Cyclopedia is “an illustrated vocabulary of terms which designate American railroad cars their parts attachments and details of construction with definitions and illustrations of typical British practice in car construction.” Ex. 1009, 2. Reproduced below is Figure 53 of the 1906 Cyclopedia.

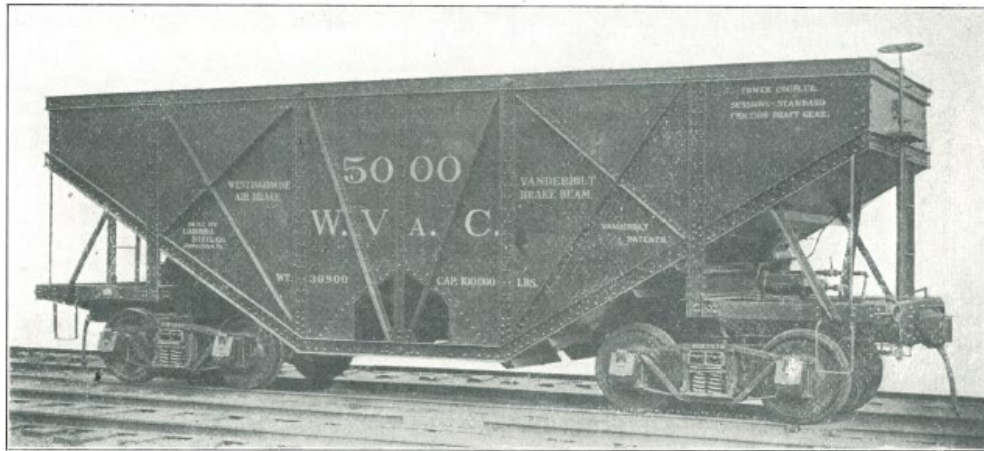


Fig. 53. Hopper Car, Structural Steel, Vanderbilt Patent. Capacity, 100,000 lbs. Weight, 36,800 lbs. Cambria Steel Co., Builders.
(Drawings of this car are shown in Figs. 417-420.)

Figure 53 shows a “Hopper Car, Structural Steel, Vanderbilt Patent.”
Ex. 1009, 4.

3. *Wong (Ex. 1006)*

Wong specifically relates “to an all-steel end structure for a railcar having an aluminum body portion.” Ex. 1006, 1:6–8. Reproduced below is Figure 4 of Wong.

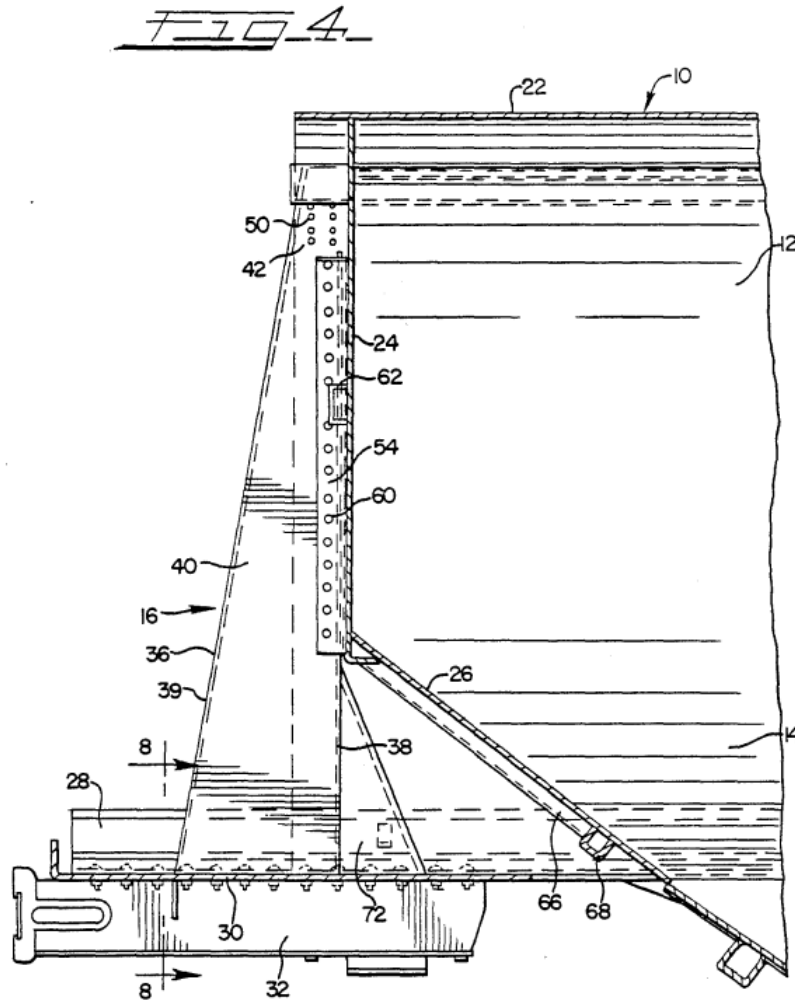


Figure 4 “is a cross-sectional view” of an end of a railcar. Ex. 1006, 2:47–48. Railcar 10 includes conventional body portion 12 that defines hopper 14. *Id.* at 3:9–10. Railcar 10 also has end structural assembly 16 at either end. *Id.* at 3:10–12.

Body portion 12 includes side sheets 18, 20, top sheet 22, end sheets 24, and end slope sheets 26. Ex. 1006, 3:15–16. Side sheets 18, 20, top sheet 22, and end sheets 24 “are of aluminum construction and are attached

to one another in a well-known manner so as to define body portion 12.” *Id.* at 3:16–20.

4. *Independent Claim 24*

Petitioner argues with citations to the record that its proposed combination of Hart, the 1906 Cyclopedia, and Wong would have rendered obvious independent claim 24. Pet. 76–78. Patent Owner disputes that Petitioner has shown that the proposed combination would have rendered obvious certain limitations of claim 24. Prelim. Resp. 49–50.

Based on our review of Petitioner’s arguments and evidence, we determine that Petitioner shows that its proposed combination of Hart, the 1906 Cyclopedia, and Wong teaches or suggests the limitations of claim 24 and that one of ordinary skill in the art would have combined those references in the manner asserted with a reasonable expectation of success. We specifically address below the limitations disputed at this stage.

- a) *“there being a first end wall extending between said first and second side walls; said first end slope sheet having an uppermost margin, said uppermost margin meeting said first end wall at a first junction; said hopper car having a first beam extending cross-wise between said first and second side walls at said first junction of said uppermost margin of said first end slope sheet and said first end wall, said first beam being a beam of hollow section; said first end wall has an upper portion and a lower portion; said upper portion of said first end wall extends upwardly of said first junction of said uppermost margin of said first end slope sheet and said first end wall; said lower portion of said end wall extends downwardly of said first junction of said uppermost margin of said first end slope sheet and said first end wall; and said lower portion of said first end wall forms part of said first beam”*

For the limitations quoted above, Petitioner refers to its arguments for similar limitations recited by claim 7. Pet. 77; *see also id.* at 12 (labeling the

limitations “24f”). For claim 7, Petitioner refers to its arguments for claim 1 that “it would have been obvious to modify Hart to add an end wall supported by an end post extending from the draft sill” in view of the 1906 Cyclopedia. *Id.* at 62; *see also id.* at 5 (labeling the limitations “7h”).

In particular, for the “end wall” of claim 1, Petitioner argues that the 1906 Cyclopedia discloses a “first end slope sheet [that] has an upper margin terminating at an end wall.” Pet. 41–42 (citing Ex. 1001, Fig. 1; Ex. 1009, 13, Fig. 53); *see also id.* at 2 (labeling the limitations “1f”). Petitioner also argues that Hart would have been modified “to add an end wall supported by an end post” “(i) by leaving the end slope sheets in place and increasing the overall height of the hopper; or (ii) 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).” *Id.* at 42 (citing Ex. 1003 ¶ 77).

Petitioner further argues that the modification would have been made because “doing so increases the hopper’s volume without increasing the rail car’s length or width (or even its height, if the end wall is added by lowering the slope sheets)” and “by 2009, end walls were common and well-known optional features of hopper cars.” Pet. 42–43 (citing Ex. 1003 ¶¶ 78, 79). Petitioner provides examples of such end walls. *Id.* at 43–45 (citing Ex. 1003 ¶ 79; Ex. 1009, Figs. 50, 52, 53, 54, 55, 56).

In Petitioner’s view, “incorporating an end wall and post (as in the Cambria Steel car) in Hart’s design would have been obvious.” Pet. 45 (citing Ex. 1003 ¶ 80). Petitioner argues that it would have been “one of a finite number of well-understood options for the end of a hopper car, *i.e.*, (i) incorporating an end wall or (ii) extending the slope sheet to the top cord,” and a “routine design choice” that would have been “governed by balancing well-understood considerations, *e.g.*, maintaining the desired

maximum exterior dimensions of the railcar, maximizing the capacity of the hopper, supporting the loads carried by the slope sheet and hopper doors, and maximizing the car's efficiency in discharging its intended lading." *Id.* (citing Ex. 1003 ¶ 80).

For the limitations quoted above, Petitioner additionally argues that "Wong discloses an end wall and a hollow section beam defined by the lower portion of the end wall and the slope sheet." Pet. 62 (citing Ex. 1006, Fig. 4). Reproduced below is Figure 4 of Wong annotated by Petitioner.

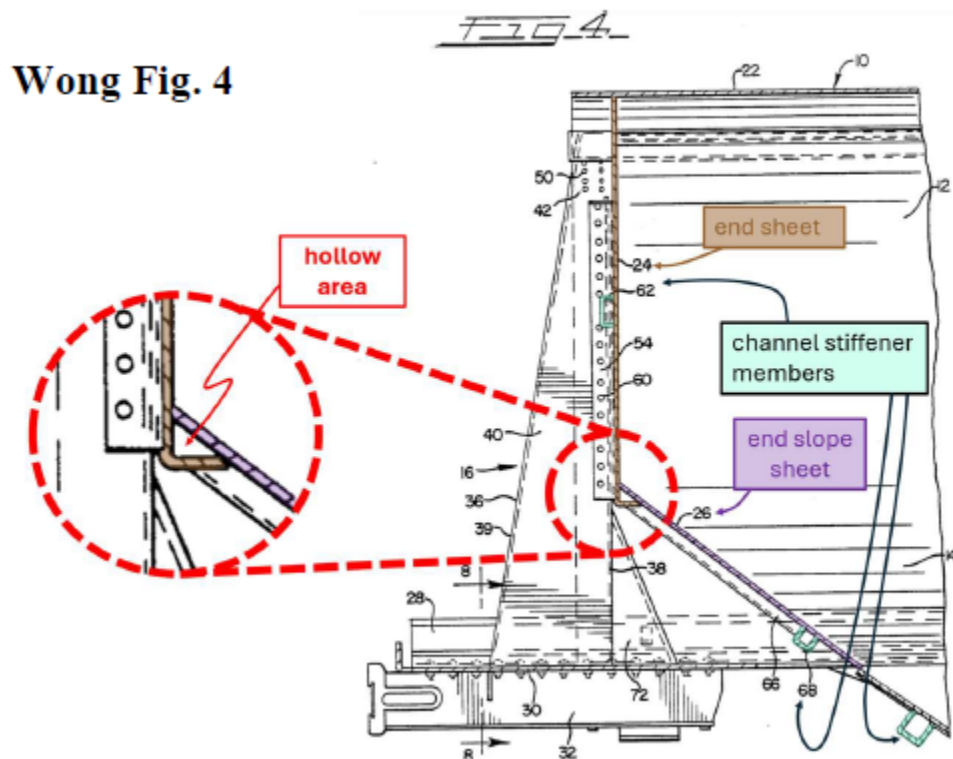


Figure 4 of Wong shows "a cross-sectional view" of an end of a railcar with Petitioner's labels for "end sheet," "channel stiffener members," and "end slope sheet." Pet. 62; Ex. 1006, 2:47–48. Petitioner also adds an enlarged view of where the "end sheet" meets the "end slope sheet" and adds a label for a "hollow area." Pet. 62.

According to Petitioner, “[i]t would have been obvious to modify Hart to further support the upper, outboard end of the slope sheet with a crosswise, L-shaped beam as in Wong,” and one of ordinary skill in the art would have been motivated to do so, because of “the benefits of reinforcing the slope sheet at its upper end, where its connection with another structure creates a stress concentration.” Pet. 63 (citing Ex. 1003 ¶ 108). Petitioner points to Hart’s transverse beam b^3 and argues that it suggests using a transverse beam like Wong if Hart is modified so that upper beam b^3 no longer supports the slope sheet. *Id.* (citing Ex. 1008, Fig. 1). Petitioner also argues that the references are in the same field and that there would have been a reasonable expectation of success. *Id.* at 63–64 (citing Ex. 1003 ¶ 108; Ex. 1008, Fig. 1).

Based on the preliminary record, Petitioner shows that its proposed combination of Hart, the 1906 Cyclopedia, and Wong teaches or suggests the above-quoted limitations of claim 24 and that one of ordinary skill in the art would have combined those references in the manner asserted with a reasonable expectation of success.

Patent Owner responds by referring to its previous arguments. Prelim. Resp. 49 (citing Pet. 77; Ex. 2035 ¶ 145). For the “end wall” of claim 1, Patent Owner responds that “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” and so Hart would not have been combined with the 1906 Cyclopedia, as proposed by Petitioner. *Id.* at 22 (citing Pet. 41–45; Ex. 1003 ¶¶ 76–81; Ex. 2035 ¶¶ 69, 70). Patent Owner also argues that the overall height of Hart would not have been increased, because rail cars are based on standard sizes and specifically designed. *Id.* at 22–23 (citing Ex. 2035 ¶ 71). Patent Owner further argues that lowering the slope sheet would change load

distribution and necessitate other changes. *Id.* at 23 (citing Pet. 42; Ex. 1003 ¶ 77; Ex. 2035 ¶ 72).

Patent Owner, thus, argues that the proposed combination would not have been one of a finite number of alternatives or routine design choice and is, instead, based on impermissible hindsight, as shown by the different relied-upon rail car designs. Prelim. Resp. 24 (citing Pet. 45; Ex. 2035 ¶ 76). Patent Owner contends that Petitioner provides no meaningful description of how the ordinarily skilled artisan “would start in view of one rail car and end up in view of others” and fails to show a reasonable likelihood that the limitation is taught or rendered obvious. *Id.* at 24–25 (citing Pet. 43–45; Ex. 1003 ¶ 79; Ex. 2035 ¶¶ 69–77).

Petitioner, however, shows that the claimed “end wall” was known in the art. Pet. 41–42, 43–45; Ex. 1003 ¶ 79; Ex. 1009, Figs. 50, 52, 53, 54, 55, 56. Petitioner also provides a reason that such a known end wall would have been added to Hart. Pet. 42–43; Ex. 1003 ¶¶ 78, 79.

Even if we agreed with Patent Owner’s contentions, Petitioner’s asserted reason of increasing the hopper’s volume, at this stage, sufficiently shows an end wall would have been added to Hart. Pet. 42–43; Ex. 1003 ¶¶ 78, 79. Patent Owner does not address directly that asserted reason. *See* Prelim. Resp. 22–25, 49. The record, at this stage, indicates that, despite the disadvantages identified by Patent Owner, end walls were used in the art and, thus, adding end walls was within the ordinary skill in the art. Ex. 1003 ¶ 79; Ex. 1009, Figs. 50, 52, 53, 54, 55, 56.

For claim 7, Patent Owner responds that Wong teaches how to combine steel and aluminum structures to avoid corrosion and is less concerned about lateral reinforcing beams. Prelim. Resp. 39–40 (citing Pet. 62–64; Ex. 1006, Figs. 3, 4; Ex. 2035 ¶¶ 110, 111). Patent Owner also

argues that Wong’s L-bracket “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” and does not provide reinforcement like the claimed “first crosswise beam” does to the slope sheet. *Id.* at 40 (citing Ex. 2035 ¶ 111). Patent Owner further argues that one of ordinary skill in the art would not have looked to Wong to improve Hart. *Id.* (citing Ex. 2035 ¶ 111).

Patent Owner additionally argues that the proposed combination is unsatisfactory for either rail car’s intended purpose, because Hart already has a structure to support the alleged end slope sheet and a redundant beam would have required redesign and analyses. Prelim. Resp. 40–41 (citing Pet. 63; Ex. 1003 ¶ 108; Ex. 2035 ¶¶ 113, 114). Patent Owner, thus, argues that Petitioner fails to show a reasonable likelihood of prevailing. *Id.* at 41 (citing Ex. 2035 ¶¶ 110–114).

Patent Owner’s arguments regarding the beam providing reinforcement is not commensurate with the scope of the above-quoted limitation. Prelim. Resp. 40. The limitation does not require the “first beam” to provide reinforcement. Ex. 1001, 28:21–35. Also, based on the preliminary record, the L-bracket identified by Petitioner in Wong would be within the scope of the above-quoted limitation. Further, at this stage, Petitioner sufficiently shows that Wong and Hart are in the same field and, thus, one of ordinary skill in the art would have looked to Wong. Pet. 63–64; Ex. 1003 ¶ 108. Additionally, Petitioner’s reason for reinforcing specifically where the asserted end wall meets the asserted end slope sheet finds support in the record at this stage, in particular its declarant’s testimony and an asserted suggestion in Hart itself. Pet. 63; Ex. 1003 ¶ 108; Ex. 1008, Fig. 1. Patent Owner has not yet addressed Petitioner’s supporting evidence. *See* Prelim. Resp. 39–41.

- b) “said lower portion of said first end wall has a margin, and said margin is bent to mate with said first end slope sheet as a second junction distant from the first junction, said lower portion of said first end wall and said uppermost margin of said first end slope sheet co-operating to define said first beam”

For the limitations quoted above, Petitioner refers to the same arguments for claim 7 summarized above. Pet. 78; *see also id.* at 12 (labeling the limitations “24i”). Patent Owner also refers to its previous responsive arguments. Prelim. Resp. 50 (citing Pet. 78; Ex. 2035 ¶ 146).

For the reasons discussed above, Petitioner sufficiently shows at this stage that its proposed combination teaches or suggests the above-quoted limitations.

5. *Petitioner Shows a Reasonable Likelihood of Prevailing*

Based on the present record, Petitioner sufficiently shows that its proposed combination of Hart, the 1906 Cyclopedia, and Wong teaches, suggests, or would have been understood to disclose the limitations of independent claim 24 and that one of ordinary skill in the art would have combined these references in the manner asserted with a reasonable expectation of success.

Petitioner, thus, shows a reasonable likelihood of prevailing in its challenge to claim 24 as unpatentable over Hart, the 1906 Cyclopedia, and Wong. We, therefore, institute review on all challenged claims on all grounds set forth in the Petition. 37 C.F.R. § 42.108(a); *see also SAS*, 138 S. Ct. at 1354.

E. Remaining Challenges

Petitioner argues with citations to the record that claims 1 and 2 are unpatentable over Hart and the 1906 Cyclopedia. Pet. 32–50. Petitioner

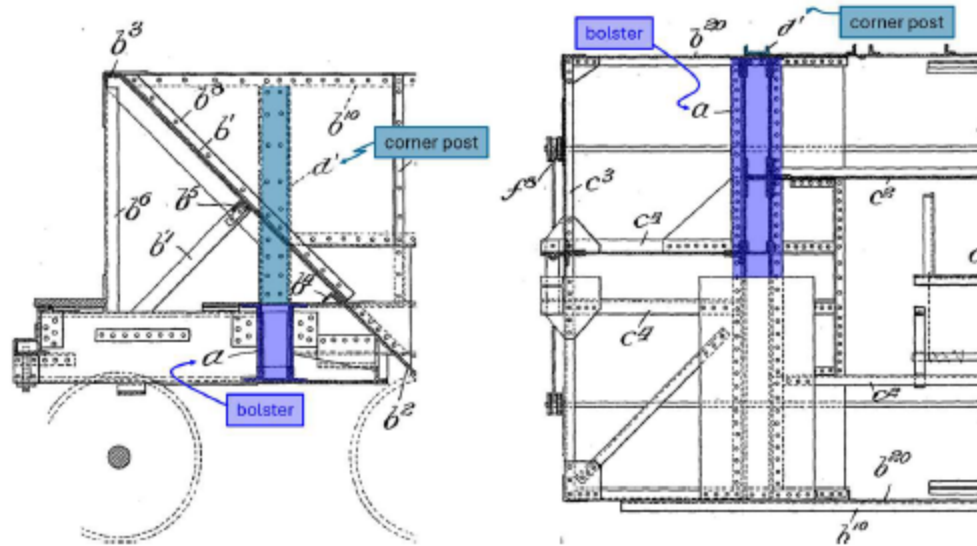
also argues with citations to the record that claims 3–23 and 25–31 are unpatentable over Hart and the 1906 Cyclopedia further combined with either (1) Schuller, (2) Schuller and Karig, (3) Campbell '652, (4) Wong, (5) Wong and Campbell '051, or (6) Wong and Schuller. *Id.* at 50–88. Petitioner further argues that claims 32–44 are unpatentable over (1) Lindström, Wong, Ratcliffe 1, and Hart or (2) Lindström, Wong, Ratcliffe 1, Hart, and the 1946 Cyclopedia. *Id.* at 89–123.

For the benefit of the parties, we provide below our preliminary analysis of the other challenged independent claims based on the record before us.

1. Claim 1

Petitioner argues with citations to the record that its proposed combination of Hart and the 1906 Cyclopedia would have rendered obvious claim 1. Pet. 32–50.

Claim 1 recites, *inter alia*, “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.*” Ex. 1001, 23:48–51 (emphasis added). Petitioner argues that supporting post *d'* of Hart discloses the claimed “corner posts.” Pet. 48 (citing Ex. 1008, Figs. 1, 3); *see also id.* at 2 (labeling the limitations “1h”). Reproduced below are Figures 1 and 3 from Hart annotated by Petitioner.



Figures 1 and 3 show “a longitudinal elevation, partly in section” and “a plan view of a portion” of Hart’s car with Petitioner’s labels for “bolster” and “corner post.” Pet. 48; Ex. 1008, 1:17–19, 1:21–22. In arguments for the “first end slope sheet” of claim 1, Petitioner contends that “Hart also discloses the claimed end slope sheets, *e.g.*, where it states that ‘*b*’ represents the inclined ends of the car and *b*² the inclined ends of the hopper bottom.” Pet. 33–34 (citing Ex. 1008, 2:46–48).

Based on the preliminary record, we agree with Patent Owner that “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.’” Prelim. Resp. 29 (citing Ex. 2035 ¶ 84).

The limitation requires “corner posts extending upwardly from said distal ends of said bolster to said first end slope sheet.” Ex. 1001, 23:49–51. Petitioner insufficiently explains how post *d*’ “extend[s] upwardly . . . to said first end slope sheet” asserted to be disclosed by inclined end *b*’ and hopper bottom inclined end *b*². Pet. 33–34, 48. Petitioner does not cite to further

evidence, such as testimonial evidence, to support its argument. *See id.* at 33–34, 48.

Hart states that:

Suitably secured to the bolsters at each side of the car are posts or stakes *d'* shown in Figs. 1 and 3 as formed of channel beams and to these posts are connected the plate girder sides *b*, these plate girder sides having a lower longitudinal member *b*⁹ and an upper member *b*¹⁰ formed of channel iron.

Ex. 1008, 1:34–41. Hart, thus, shows and expressly indicates that posts *d'* extend upwardly outboard of inclined end *b'* and past inclined end *b'* to upper member *b*¹⁰. *Id.* at 1:34–41, Figs. 1, 3. Petitioner's own annotated Figures 1 and 3 appear to agree that posts *d'* extend upwardly outboard of and above inclined end *b'*. Pet. 48. Hart does not show, and Petitioner does not sufficiently explain how, posts *d'* extend upwardly to inclined end *b'*. *See* Ex. 1008, 1:34–41, Figs. 1–6. At this stage, we question whether Petitioner shows that its proposed combination of Hart and the 1906 Cyclopedia teaches or suggests all the limitations of claim 1.

2. Independent Claim 7

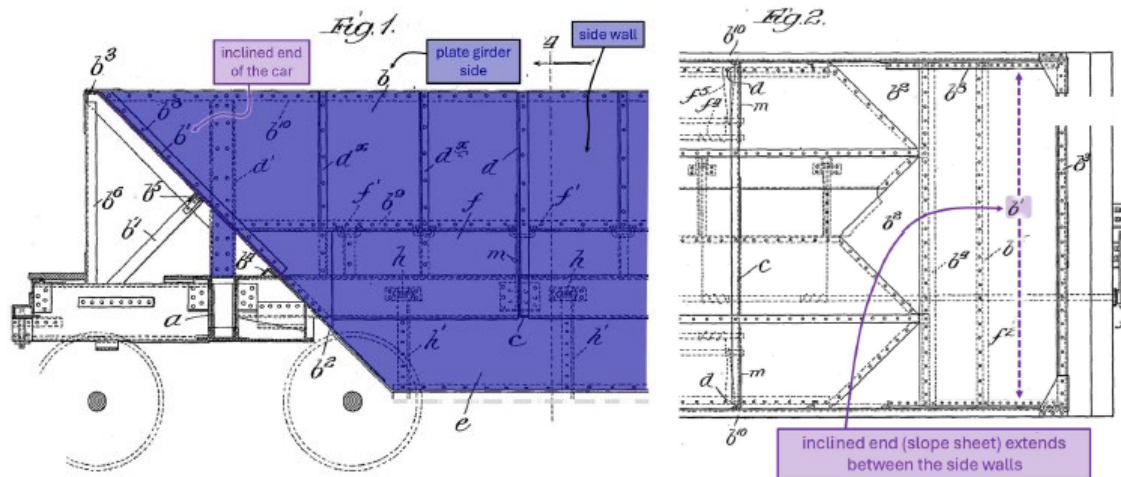
Petitioner argues with citations to the record that its proposed combination of Hart, the 1906 Cyclopedia, and Wong would have rendered obvious independent claim 7. Pet. 58–64.

Claim 7 recites, *inter alia*:

a first laterally extending reinforcement mounted crosswise 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*.

hollow section beam extending across said hopper car between said first and second side walls.” Prelim. Resp. 37–38 (citing Pet. 59; Ex. 2035 ¶ 107).

Claim 7 requires a “first laterally extending reinforcement defining part of a first hollow section beam extending across said hopper car between said first and second side walls.” Ex. 1001, 24:54–56. In arguments for the “side walls” of claim 7, Petitioner contends that Hart discloses “first and second side walls running lengthwise along first and second sides of said car, said first end slope sheet of said hopper extending cross-wise between said first and second side walls.” Pet. 59. Reproduced below are Figures 1 and 2 of Hart with Petitioner’s annotations.



Figures 1 and 2 show “a longitudinal elevation, partly in section” and “a plan view of a portion of one end” of Hart’s car with Petitioner’s labels for “inclined end of the car,” “plate girder side,” “side wall,” and “inclined end (slope sheet) extends between the side walls.” Pet. 59; Ex. 1008, 1:17–21. Taking together Petitioner’s arguments for the recited “side walls” and “first laterally extending reinforcement,” Petitioner insufficiently argues that the asserted “laterally extending reinforcement” of Hart (transverse member b^4) extends between the asserted “side walls” of Hart (plate girder side b).

Pet. 59, 60–61. Petitioner does not cite to further evidence, such as testimonial evidence, to support its argument. *See id.* at 59, 60–61.

Thus, based on the preliminary record, Petitioner does not appear to show that its proposed combination of Hart, the 1906 Cyclopedia, and Wong teaches or suggests all the limitations of independent claim 7.

3. *Independent Claim 18*

Petitioner argues with citations to the record that its proposed combination of Hart, the 1906 Cyclopedia, Wong, and Campbell '051 would have rendered obvious independent claim 18. Pet. 83–86.

Claim 18 recites, *inter alia*:

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.

Ex. 1001, 26:11–20 (emphases added).

For the limitations quoted above, Petitioner refers to its arguments for similar limitations in claim 7. Pet. 84; *see also id.* at 7 (labeling the limitations “18f”). Patent Owner also refers to its previous responsive arguments. Prelim. Resp. 56 (citing Ex. 2035 ¶ 164).

For the reasons stated above for claim 7, based on the preliminary record, Petitioner does not appear to show that the asserted “laterally extending reinforcement” of Hart (transverse member b^4) extends between the asserted “side walls” of Hart (plate girder side b), as required by claim 18. Pet. 59, 60–61, 84. Thus, at this stage, we question whether

Petitioner shows that its proposed combination of Hart, the 1906 Cyclopedia, Wong, and Campbell '051 teaches or suggests all the limitations of independent claim 18.

4. *Independent Claim 20*

Petitioner argues with citations to the record that its proposed combination of Hart, the 1906 Cyclopedia, and Wong would have rendered obvious independent claim 20. Pet. 72–75.

Claim 20 recites, *inter alia*:

said main bolster of said first end section of said railroad hopper car has first and second ends at laterally outboard extremities thereof;

said hopper car has first and second corner posts mounted at said first and second ends of said main bolster of said first end section, said *corner posts extending upwardly from said main bolster to said first end slope sheet*.

Ex. 1001, 27:28–34 (emphasis added).

For the limitations quoted above, Petitioner refers to its arguments for claim 1 that Hart discloses similar limitations recited by that claim. Pet. 74; *see also id.* at 10 (labeling the limitations “20h”). Patent Owner also refers to its previous responsive arguments. Prelim. Resp. 47 (citing Pet. 74; Ex. 2035 ¶ 138).

For the reasons stated above for claim 1, based on the preliminary record, it appears Petitioner may not have shown that post *d'* “extend[s] upwardly from said main bolster to said first end slope sheet,” as required by claim 20. Pet. 33–34, 48, 74. Thus, at this stage, we question whether Petitioner shows that its proposed combination of Hart, the 1906 Cyclopedia, and Wong teaches or suggests all the limitations of independent claim 20.

5. *Independent Claim 32*

Petitioner argues with citations to the record that its proposed combination of Lindström, Wong, Ratcliffe 1, and Hart would have rendered obvious independent claim 32. Pet. 89–102.

Claim 32 recites, *inter alia*:

said first end section includes an end post extending upwardly of said draft sill, said end post being mounted above said draft sill distant from said truck center and proximate said striker end;

said end post extending upwardly to meet said first beam and said top chord;

Ex. 1001, 30:1–6 (emphasis added).

Petitioner argues that Ratcliffe 1 discloses a hopper car with “three end posts extending from the laterally outboard margin of the shear plate to the lower margin of the end wall” with a central post “positioned above the draft sill.” Pet. 98–99 (citing Ex. 1003 ¶ 130; Ex. 1017, 55); *see also id.* at 15 (labeling the limitations “32i”). Petitioner proposes modifying “Lindström to incorporate an end post like the central end post in Ratcliffe 1 (either alone or with an end post on each side) to support the longitudinal end of the rail car.” *Id.* at 99 (citing Ex. 1003 ¶ 131). According to Petitioner, “the end wall creates extra loads at the end of the car, compared to designs where the slope sheet extends to the end top chord.” *Id.* (citing Ex. 1003 ¶ 131).

Petitioner argues that one of ordinary skill in the art “would have been motivated to place the base of the end post as close as possible to the outboard margin of the draft sill, as in Ratcliffe 1, to maximize the usable space of the shear-plate platform.” Pet. 99–100 (citing Ex. 1003 ¶ 131). Petitioner also argues that “the end post would be proximate Lindström’s

striker and distant from Lindström's truck center." *Id.* at 100 (citing Ex. 1005, Fig. 6). Reproduced below is Figure 6 of Lindström with Petitioner's annotations.

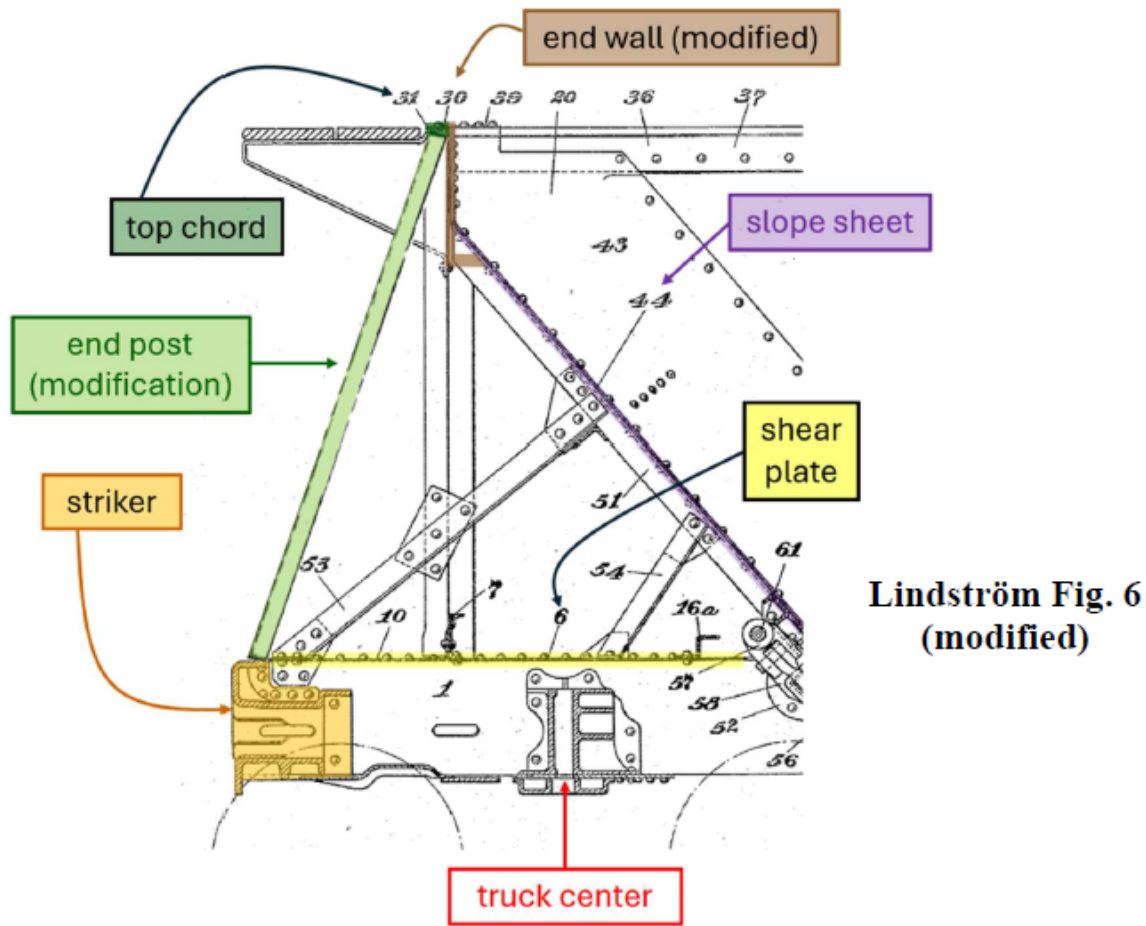


Figure 6 of Lindström shows “an enlarged longitudinal sectional view of a portion of the length” of Lindström's car with Petitioner's modified end wall, added end post, and labels for “end wall (modified),” “slope sheet,” “shear plate,” “truck center,” “striker,” “end post (modification)” and “top chord.” Pet. 100; Ex. 1005, 1:60–62. The annotated figure also shows Petitioner's proposed modification of Lindström in view of Wong so that the proposed combination has “a first beam extending cross-wise between said first and second side walls at said first junction of said uppermost margin of

said first end slope sheet and said first end wall, said first beam being a beam of hollow section.” Pet. 95–97.

Based on the preliminary record, we agree with Patent Owner that Ratcliffe 1 does not teach or suggest the “end post extending upwardly to meet said first beam and said top chord,” and, thus, the proposed combination would not have the recited “end post.” Prelim. Resp. 60–61 (citing Pet. 99; Ex. 2035 ¶¶ 179, 180). We also agree with Patent Owner that the proposed combination does not have an “end post extending upwardly to meet said first beam,” because the alleged end post meets the alleged top chord and end wall, not a “first beam.” *Id.* at 61–62 (citing Pet. 98–100; Ex. 1003 ¶¶ 130–131; Ex. 2035 ¶¶ 181, 185).

Even if we agreed that one of ordinary skill in the art would have made the proposed modifications to Lindström, Petitioner’s modifications, as shown in its annotated Figure 6 of Lindström, does not appear to have the end post of Ratcliffe 1 “extending upwardly to meet said first beam and said top chord,” as required by claim 32. Pet. 100. As Petitioner’s annotated figure shows, the added end post meets a top chord, but not the asserted first beam. *See id.* Petitioner and its declarant also do not explain how the added end beam meets the asserted first beam and the top chord. *Id.* at 98–100; Ex. 1003 ¶¶ 130, 131.

Thus, at this stage, we question whether Petitioner shows that its proposed combination of Lindström, Wong, Ratcliffe 1, and Hart teaches or suggests all the limitations of independent claim 32.

F. Remaining Arguments

Patent Owner contends that Petitioner and its declarant “amend the exhibits of the asserted art to add details that are not present.” Prelim. Resp. 2. We agree with Petitioner that Patent Owner does not elaborate

further on its contention and “never provides any example of an exhibit that Petitioner supposedly ‘amended.’” Paper 18, 1.

Patent Owner, in its Preliminary Sur-Reply, identifies Exhibit 1004. Paper 22, 1–3. As summarized above, Exhibit 1004 is the 1946 Cyclopedia, and that reference is asserted in combination with Lindström, Wong, Ratcliffe 1, and Hart against dependent claims 35–44. The parties’ dispute regarding Exhibit 1004 does not affect our determination above regarding claim 24 and, thus, our determination that Petitioner shows a reasonable likelihood that it would prevail in its challenge to claim 24.

Patent Owner also contends that Petitioner’s declarant did not consider whether the claimed invention as a whole would have been obvious and ignored certain limitations of claim 1. Prelim. Resp. 13–14; Paper 22, 3–4. Patent Owner, thus, argues that his testimony should not be given any weight. Prelim. Resp. 14; Paper 22, 4. Petitioner, however, provides citations to his testimony that demonstrate all claim limitations were considered and the claims as a whole were also considered. Paper 18, 2–3 (citing Ex. 1003 ¶¶ 17, 24, 54–59, 68). The parties may further develop this issue during trial.

III. CONCLUSION

After considering the evidence and arguments presented in the Petition and the cited evidence, we determine that Petitioner has demonstrated a reasonable likelihood of prevailing in proving that at least one of claims 1–44 of the ’515 patent is unpatentable, and thus, we institute an *inter partes* review of all challenged claims on all presented challenges. 37 C.F.R. § 42.108(a).

At this stage of the proceeding, the Board has not made a final determination as to the patentability of any challenged claim or any underlying factual and legal issues.

IV. ORDER

In consideration of the foregoing, it is hereby:

ORDERED that, pursuant to 35 U.S.C. § 314(a), an *inter partes* review of claims 1–44 of U.S. Patent No. 8,132,515 B2 is instituted with respect to all grounds set forth in the Petition; and

FURTHER ORDERED that, pursuant to 35 U.S.C. § 314(c) and 37 C.F.R. § 42.4(b), *inter partes* review of U.S. Patent No. 8,132,515 B2 shall commence on the entry date of this Order, and notice is hereby given of the institution of a trial.

IPR2025-01047
Patent 8,132,515 B2

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