

Double-Sheathed Alloy-Steel Box Car of 50 Tons Capacity, Built by the Magor Car Corporation

# Delaware, Lackawanna & Western Lightweight Box Cars

A. A. R. 50-ton cars, embodying the use of USS Cor-Ten steel, weigh 44,000 lb., light, and have a load limit of 169,000 lb.

**I**N November, 1939, the Delaware, Lackawanna & Western placed an order with the Magor Car Corporation, New York, for 500 double-sheathed steel box cars of 50 tons capacity which are now being completed at the Passaic, N. J., plant of that builder, 280 of the cars having been delivered and placed in service. These cars are designed for the handling of high-class commodities such as grain. Each car has a cubic capacity of 3,712 cu. ft. and through the extensive use of USS Cor-Ten and Man-Ten steel in the various members of the underframe and superstructure, a car having a light weight of 44,000 lb. and a load limit of 125,000 lb. has been produced. The ratio of pay load to gross load is 74.0 per cent.

## Underframe Construction

The center sills consist of two A. A. R. Z-shaped standard sections weighing 36.21 lb. per ft. These center-sill members are spaced 12 $\frac{7}{8}$  in. between the webs and extend the full length of the car from buffer to buffer. The center sill spacers, six in number, are Cor-Ten pressings. The top center-sill flanges are joined by welding, the welded seam running the entire length of the sills.

The side sills are 6-in. by 3 $\frac{1}{2}$ -in. by  $\frac{1}{4}$ -in. Cor-Ten angles, in one piece, and extend the full length of the car. They are reinforced at the center of the car and at the bolster positions. The end sills are Cor-Ten angles of the same dimensions as the side sills and extend the full width of the car. The body bolsters are of the built-up type, each one consisting of four pressed Cor-Ten diaphragms,  $\frac{3}{16}$  in. thick spaced 12 in. apart. The bol-

## Principal Weights and Dimensions of D. L. & W. Box Cars

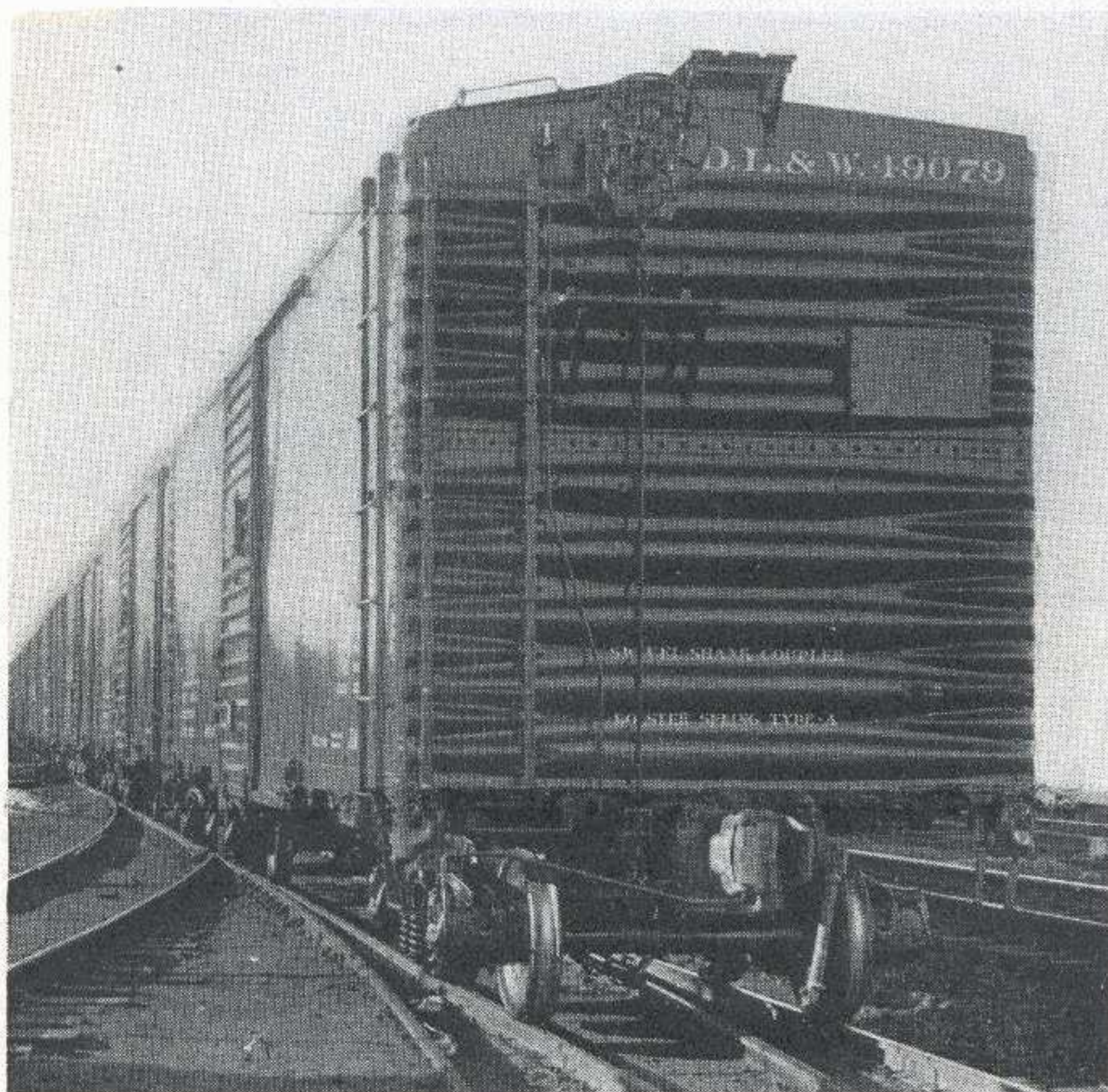
Length inside of body, ft.-in. ....	40- 6
Width inside of body, ft.-in. ....	9- 2
Height from floor to roof at inside, width, ft.-in. ....	10- 0
Width of side-door opening, ft.-in. ....	6- 0
Height of side-door opening, ft.-in. ....	9- 4 $\frac{11}{16}$
Length over striking plates, ft.-in. ....	41- 8 $\frac{1}{2}$
Length center to center of trucks, ft.-in. ....	30- 8 $\frac{1}{2}$
Width of car over side sills, ft.-in. ....	9- 9 $\frac{5}{8}$
Width over side plates, ft.-in. ....	9-10 $\frac{3}{8}$
Cubical capacity, cu. ft. ....	3,712
Weight capacity, nominal, lb. ....	100,000
Pay load limit, lb. ....	125,000
Light weight, lb. ....	44,000
Ratio of pay load to gross load, per cent ....	74.0

ster cover plates, both top and bottom, are  $\frac{5}{16}$  in. by 21 in. Man-Ten extending from side sill to side sill. The cross-bearers are built up of  $\frac{3}{16}$ -in. pressed Cor-Ten

diaphragms with  $\frac{1}{4}$ -in. by 8-in. Man-Ten top and bottom cover plates. The crossies, four on each side of the car, are made of  $\frac{1}{8}$ -in. Cor-Ten steel extending from the center sill to the side sills with the top flange arranged to support 3-in., 5.1-lb. Cor-Ten Z-bars which in turn support the car floor. The floor-support diaphragm connections and diagonal corner braces are  $\frac{3}{16}$ -in. Cor-Ten pressed members.

### The Superstructure

There are 16 side posts consisting of A. A. R. 3-in., 5.1-lb. rolled Z bars. These are riveted to the side sills and the bottom flange of the side plate. This latter member is an A. A. R. W-section weighing 9.83 lb. and ex-



The Dreadnaught Ends Have Flanged Rounded Corners—The Trucks Are the Spring-Plankless Type with Chilled Iron Wheels Having Ground Treads

tending in one piece the full length of the car. The door posts are 4-in. by 3-in. by  $\frac{3}{16}$ -in. Cor-Ten angles riveted to the side sills and side plates in the same manner as the side posts, except that they are reinforced at the top and bottom side members with  $\frac{3}{16}$ -in. gusset plates. The corners of the car are closed at the side plates with  $\frac{1}{8}$ -in. Cor-Ten pressed caps.

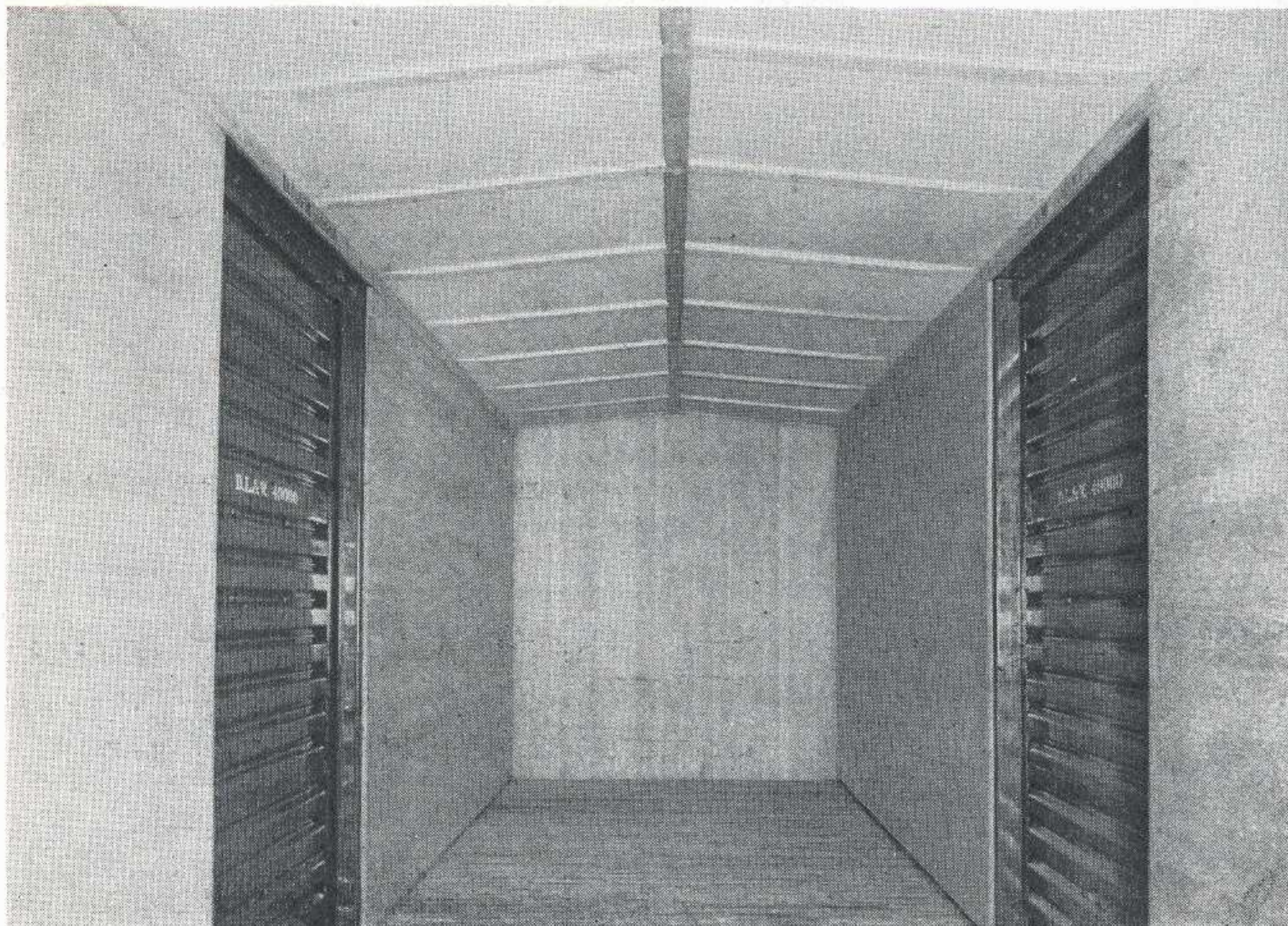
The side sheathing is  $\frac{1}{16}$ -in. Cor-Ten sheet extending in one-piece panels from side sill to side plate with lap joints at all side posts. The joints are waterproofed and the sheathing is riveted to the framing. The car ends are the Union Metal Products Company's Dreadnaught steel ends, made in two sections. The upper sections of these ends are  $\frac{3}{16}$  in. thick and the lower sections  $\frac{1}{4}$  in. thick. The upper edges of the car ends are flanged to conform to the roof contour and form the body end plates. The sides of the steel ends are flanged to form a rounded car corner which, in turn, forms the corner-post covering. The side flange joints are welded.

The cars are equipped with Youngstown steel doors and Camel roller lift fixtures. All openings around the doors and fixtures are welded. The threshold plates are  $\frac{1}{8}$ -in. pressed Cor-Ten members extending from door post to door post and attached to the side sills with  $\frac{1}{4}$ -in. countersunk bolts.

The car roof is a Standard Railway Equipment Manufacturing Company's Murphy improved galvanized copper-bearing-steel roof of No. 15 gage with running-board saddles of the same material  $\frac{1}{8}$  in. thick. The running boards are wood and are applied in three lengths.

The side and end linings of the cars are  $1\frac{3}{16}$ -in. tongue-and-groove Douglas fir dressed to  $3\frac{1}{4}$ -in. face. In the side lining each board is in one piece extending from the door post cap to the steel end. The lining boards are placed  $1\frac{1}{2}$  in. from the top of the floor and extend to the ceiling so that no metal is exposed inside the car at the side plates. The end lining is nailed vertically to six 3-in. by 3-in. wood fillers bolted into corrugations of the steel ends. The interior of the car is ceiled with  $\frac{1}{4}$ -in. plywood applied crosswise of the car in two panels extending from side plate to ridge pole and spliced at each carline.

The flooring is tongue-and-groove southern yellow  
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The Interior of the Car Is Completely Lined With Douglas Fir Side and End Planking, Pine Flooring and Plywood Ceiling—The Door Openings Are Six Feet Wide

Selected Income Items by Regions and Districts, Class I Steam Railways, 1939 and 1938—Continued

Region and Railway	Net Railway Operating Income		Total Income		Total Deductions		Net Income	
	1939	1938	1939	1938	1939	1938	1939	1938
Monongahela Ry. ....	\$1,254,230	\$935,507	\$1,266,902	\$949,363	\$639,749	\$645,698	\$627,153	\$303,665
Montour R. R. ....	843,516	660,273	847,817	665,243	87,515	90,606	760,302	574,637
Nevada Northern Ry. ....	225,509	161,160	236,588	175,058	1,101	1,371	235,487	173,687
New Haven System:								
New York, New Haven & Hartford R. R.†	8,462,922	517,047	11,254,391	2,942,830	14,168,505	14,566,023	*2,914,114	*11,623,193
New York, Ontario & Western Ry.‡	*496,675	*599,496	*464,068	*576,767	1,418,716	1,417,547	*1,882,784	*1,994,314
New York Central Lines:								
New York Central R. R. ....	37,303,427	15,582,476	54,196,848	30,756,142	49,687,612	50,910,499	4,509,236	*20,154,357
Pittsburgh & Lake Erie R. R. ..	3,806,716	1,803,166	4,316,402	2,054,682	726,153	356,161	3,590,249	1,698,521
New York Connecting R. R. ....	1,318,029	1,309,242	1,342,326	1,324,536	1,326,580	1,326,787	15,746	*2,251
Norfolk & Western Ry. ....	31,659,216	21,722,288	34,399,614	24,395,322	3,810,299	3,856,480	30,589,315	20,538,842
Norfolk Southern R. R.†	350,933	222,259	531,320	399,999	884,583	889,407	*353,263	*489,408
Northern Pacific Ry. ....	10,479,237	6,297,356	14,827,848	10,560,456	14,754,195	14,882,872	73,653	*4,322,416
Oklahoma City-Ada-Atoka Ry. ....	57,447	18,686	59,942	21,314	38,971	19,627	20,971	1,687
Pennsylvania System:								
Long Island R. R. ....	258,095	*217,965	734,250	208,277	2,472,402	2,417,953	*1,738,152	*2,209,676
Pennsylvania R. R. ....	77,304,328	57,332,898	114,168,558	93,559,078	82,136,033	82,512,978	32,032,525	11,046,100
Pennsylvania - Reading Seashore Lines	*1,812,029	*2,133,217	*1,634,172	*1,956,391	1,069,645	1,074,067	*2,703,817	*3,030,458
Pere Marquette Ry. ....	3,352,085	853,602	3,712,648	1,167,599	3,384,492	3,427,402	328,156	*2,259,803
Pittsburg & Shawmut R. R. ....	32,648	*74,257	40,140	*49,709	16,555	24,683	23,585	*74,392
Pittsburg & West Virginia Ry. ..	1,076,852	627,867	1,412,613	725,525	932,402	925,738	480,211	*200,213
Pittsburg, Shawmut & Northern R. R.†	116,598	45,096	122,354	51,095	129,211	128,201	*6,857	*77,106
Reading System:								
Central R. R. of New Jersey‡ ..	1,943,304	259,144	2,877,613	1,178,294	5,454,655	5,443,119	*2,577,042	*4,264,825
Reading Co. ....	11,931,004	10,104,324	13,852,816	12,379,101	9,131,165	9,083,792	4,721,651	3,295,309
Richmond, Fredericksburg & Potomac R. R. ....	1,214,911	635,005	1,432,862	855,111	343,525	339,801	1,089,337	515,310
Rutland R. R.†	135,445	*530,677	191,588	*480,396	412,790	411,401	*221,202	*891,797
Seaboard Air Line Ry.†	3,594,371	1,449,486	3,931,714	1,764,724	9,488,269	9,354,885	*5,556,555	*7,590,161
Southern System:								
Alabama Great Southern R. R. ...	1,768,249	1,414,642	2,665,640	2,062,635	554,589	566,456	2,111,051	1,496,179
Cincinnati, New Orleans & Texas Pacific Ry. ....	5,185,058	3,996,690	5,274,406	4,086,028	1,871,624	1,872,237	3,402,782	2,213,791
Georgia Southern & Florida Ry. ...	118,777	29,789	127,030	37,364	296,658	304,016	*169,628	*266,652
Mobile & Ohio R. R.†	1,024,006	964,186	1,085,442	1,024,104	1,526,366	1,582,450	*440,924	*558,346
New Orleans & Northeastern R. R.	503,713	415,098	529,419	441,986	395,827	395,942	133,592	46,044
Northern Alabama Ry. ....	109,264	36,096	109,834	36,441	109,444	109,529	390	*73,088
Southern Ry. ....	20,521,866	14,343,565	23,781,719	16,439,955	17,294,383	16,937,727	6,487,336	*497,772
Southern Pacific System:								
Northwestern Pacific R. R. ....	*354,801	*921,446	*335,942	*903,621	1,454,709	1,491,834	*1,790,651	*2,395,455
St. Louis Southwestern Lines‡ ..	1,142,599	2,020,021	1,223,105	2,102,892	3,241,426	3,029,769	*2,018,321	*926,877
Southern Pacific Co. ....	23,254,992	10,959,982	43,166,358	32,694,353	37,410,986	30,268,914	5,755,372	2,425,439
Texas & New Orleans R. R. ....	5,173,417	3,337,021	5,481,405	3,650,649	4,524,593	4,835,593	956,812	*1,184,944
Spokane, Portland & Seattle Ry. ..	821,023	721,778	1,046,406	892,265	3,682,702	3,696,310	*2,636,296	*2,804,045
Tennessee Central Ry. ....	298,841	243,256	328,064	259,538	242,938	214,847	85,126	44,691
Texas Mexican Ry. ....	82,469	10,790	96,464	23,495	502,372	496,754	*405,908	*473,259
Toledo, Peoria & Western R. R. ...	346,484	329,071	361,484	349,168	84,266	83,690	277,218	265,478
Union Pacific R. R. ....	20,233,188	19,867,391	37,916,098	37,268,254	18,949,466	18,567,020	18,966,632	18,701,234
Utah Ry. ....	61,624	*50,031	65,017	*46,302	1,105	57,251	63,912	*103,553
Virginian Ry. ....	9,028,510	7,879,135	9,109,876	7,959,051	2,353,279	2,386,495	6,756,597	5,572,556
Wabash System:								
Ann Arbor R. R.†	368,563	118,136	385,211	135,893	451,688	460,296	*66,477	*324,403
Wabash Ry.†	3,559,246	1,297,490	3,993,788	1,652,191	7,535,972	7,780,082	*3,542,184	*6,127,891
Western Maryland Ry. ....	4,775,969	3,643,434	4,909,286	3,792,816	3,347,185	3,337,355	1,562,101	455,461
Western Pacific R. R.†	1,674,490	*932,450	1,965,467	*599,652	3,933,106	3,850,837	*1,967,639	*4,450,489
Wheeling & Lake Erie Ry. ....	4,083,761	2,184,561	4,226,895	2,330,726	648,612	636,798	3,578,283	1,693,928

\* Deficit or other reverse items.

† Report of receiver or receivers.

‡ Report of trustee or trustees.

|| Includes St. Louis Southwestern Ry. and St. Louis Southwestern Ry. of Texas.

D. L. & W. Lightweight Box Cars

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pine dressed 1 1/4 in. thick by 5 1/16 in. face. The floor planks are laid, in one piece, from side sill to side sill. Each floor board is held in place by three 1/2-in. MacLean-Fogg watertight bolts with lock nuts. After the floor was laid, it was sealed by applying caulking cement at the ends and sides in order to make the car completely grain tight. The watertight bolts have the heads pulled in 1/16 in. below the surface of the floor boards.

The trucks are the Symington spring-plankless double-truss design with cast-steel side frames having journal boxes cast integral. The truck wheel-base is 5 ft. 6 in. Each truck spring group consists of five outer single A. A. R. Type D-2 coil springs and one Cardwell Type A friction bolster spring. The truck bolsters are cast steel with center plates cast integral. Stucki rocker roller side bearings are used on the truck bolsters with hardened steel body side bearings. The truck axles conform to A. A. R. specification M-101-37 and have 5 1/2-in. by 10-in. burnished journals. The wheels are 33 in. diameter chilled cast iron, with treads ground after mounting. The journal bearings are A. A. R. standard 5 1/2-in. by 10-in. journals, lead lined, furnished by the

Magnus Metal Corporation. The brake beams are A. A. R. No. 15 beams with malleable-iron heads, manufactured by the Buffalo Brake Beam Company. The brake hangers are the Schaeffer drop forged loop type. Creco four-point brake beam supports are used on the trucks. The cars are equipped with cast steel striking castings, Cardwell Type L-25-SA friction draft gears, and Union centering devices. The couplers are A. A. R. Type E bottom-rotary-operated swivel-shank couplers slotted for 6-in. by 1 1/2-in. keys.

The brake equipment on these cars is schedule AB-10, furnished by Westinghouse, with brake rigging designed to produce a braking force equal to 65 per cent of the lightweight of the car at 50-lb. cylinder pressure. Extra-heavy wrought-iron pipe is used for the brake pipe and retaining-valve pipe with extra-heavy pipe fittings. The air-brake piping is secured to the car by Wright pipe clamps. The hand-brake equipment was supplied by the Ajax Hand Brake Company and is designed to develop 3,950-lb. pull at the brake-cylinder push rod connection to the cylinder lever.

The car bodies were finished with three coats of red lead and paint, the final coat being D. L. & W. standard freight-car brown. The underframe, trucks and roof are painted black. The stencilling on the cars is white.