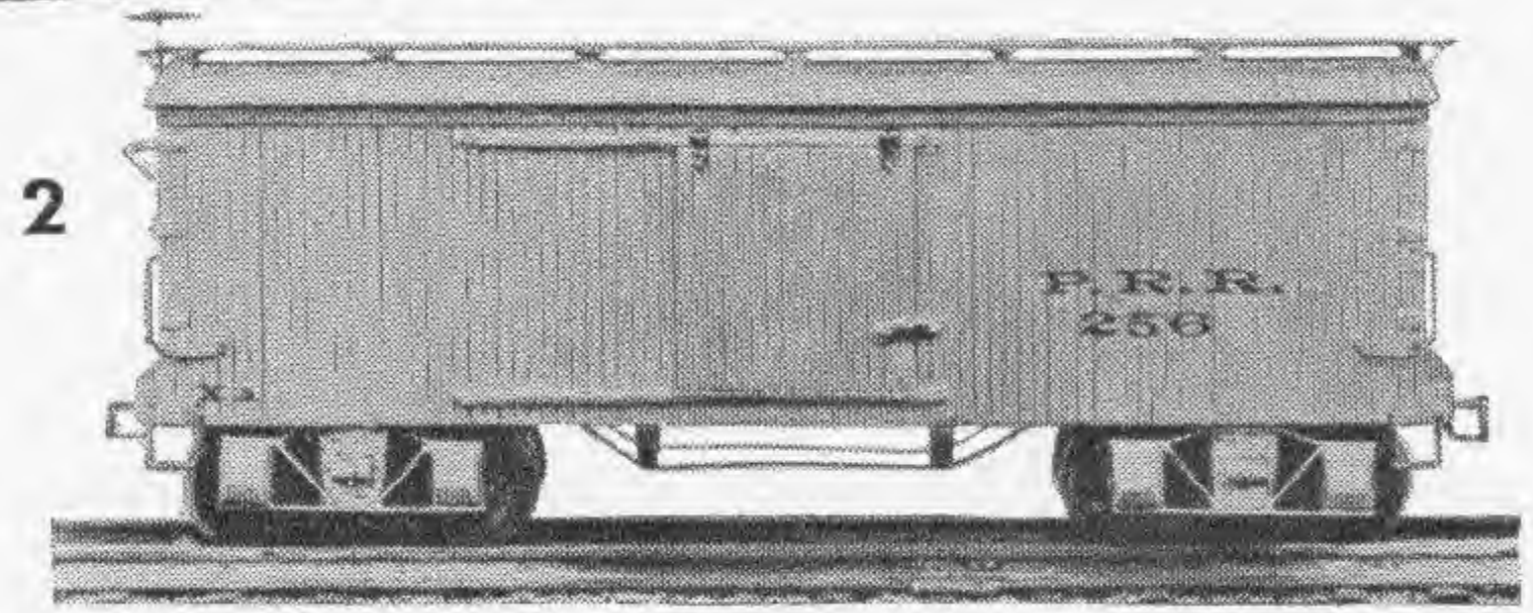
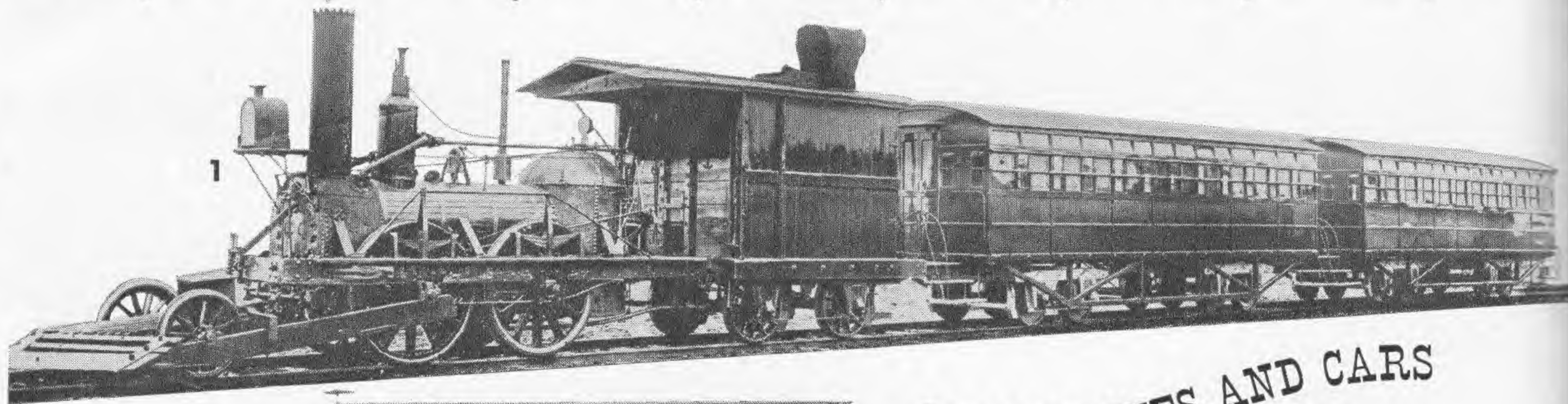


MODERN  
LOCOMOTIVES  
AND CARS  
1939

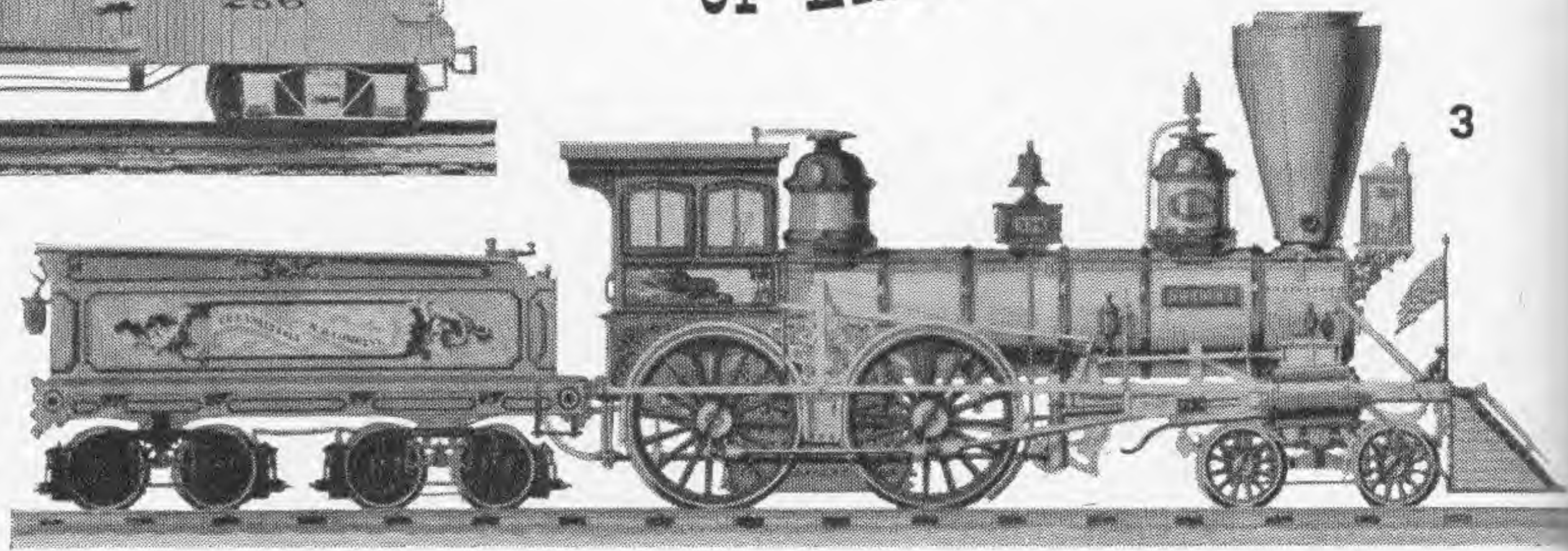
PENNSYLVANIA RAILROAD

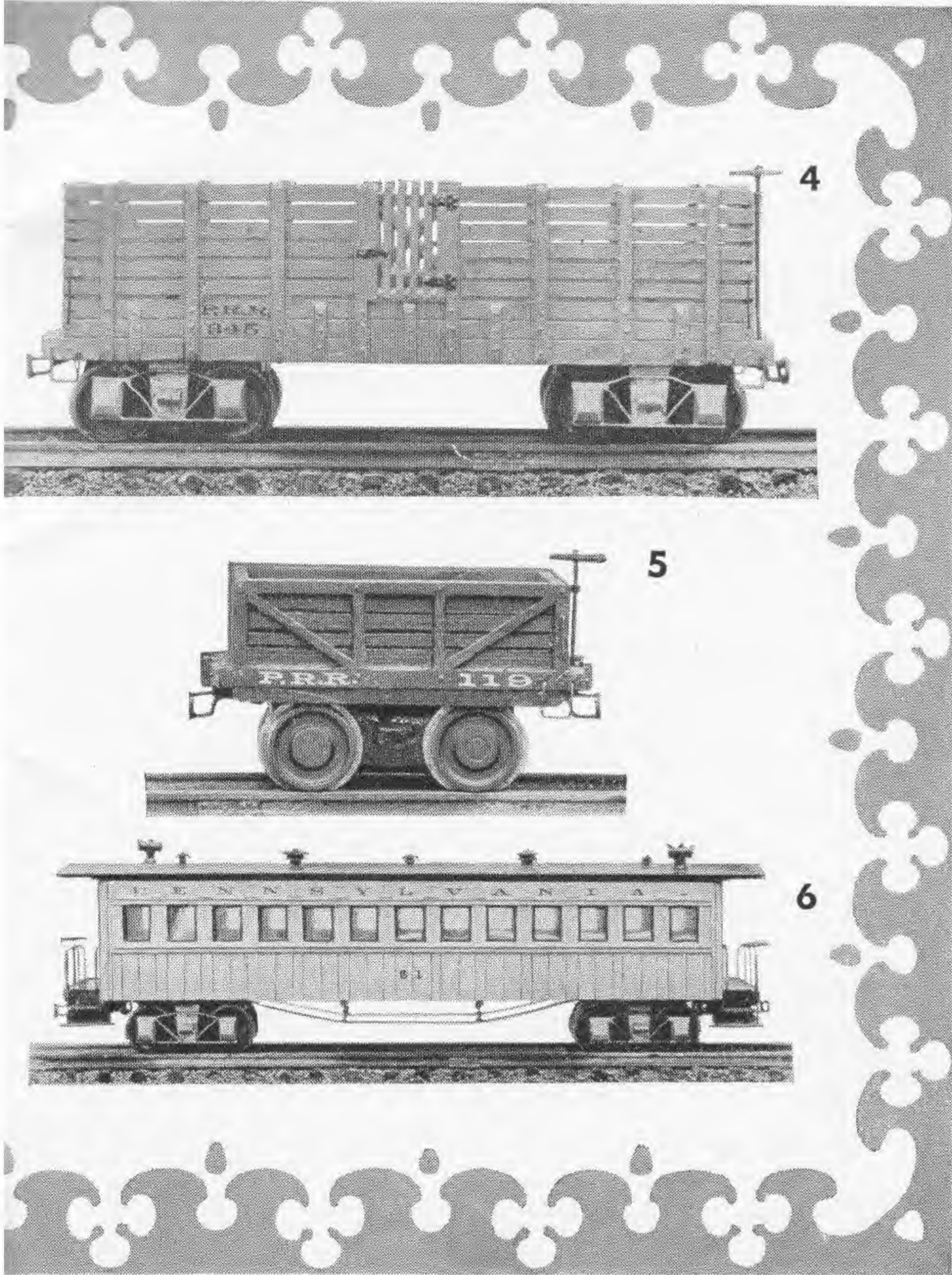


LOCOMOTIVES AND CARS  
OF EARLY DAYS

1. The "John Bull," placed in service on the Camden and Amboy Railroad in 1831, was the first locomotive used on any line now included in the Pennsylvania System. The old Camden and Amboy Railroad is now part of the New York Division.

The other pictures are typical examples of equipment in use on the Pennsylvania Railroad about eighty years ago, and are as follows: (2) Box car, (3) Passenger locomotive built in 1856, (4) Open top stock car, (5) four-wheeled coal car, (6) Passenger coach.





## ... AND NOW TO THE PRESENT

We live in a fast-moving age. As one of our foremost business leaders aptly put it, "The only thing certain about the present is *change*." He might well have been speaking about the Pennsylvania Railroad, because its policy is, and always has been, to build for the future, and thus anticipate transportation needs. As a result, the Pennsylvania Railroad has long been recognized as a leader in the advancement of the science of railroading.

Today the Pennsylvania Railroad operates the largest fleet of air-conditioned trains in the world and provides in its east and west blue ribbon passenger service a *Fleet of Modernism*. It has introduced the most advanced types of freight cars adapted to every need of industry, as well as the highly popular pick-up and delivery service, from door to door, by rail and truck, for less than carload merchandise shipments. In addition to its

extensive steam-powered operation, it possesses the greatest electrified railroad system in the country (40% of the electrified standard railroad trackage in the United States is on the Pennsylvania Railroad).

#### **A PIONEER IN PROGRESS**

And now, this year it is placing on the rails the largest, fastest, most powerful passenger steam locomotive, capable of sustained speeds of more than 100 miles an hour. All of this is a result

of a long tradition of keeping ahead — not merely abreast — of the times. The Pennsylvania Railroad has pioneered in developing and adopting many of the fundamental improvements by which the art of railroading has been advanced, among them the use of steel rails to replace iron, the adoption of the air brake, the use of the telephone in railroading, and the installation of switch and signal interlockings. Other outstanding contributions to safety have been the adoption of

block and position light signals, the introduction of the cab signal, and the adoption of all-steel construction as the standard for passenger cars and freight cars.

### **THOUSANDS OF TRAINS**

With thousands of trains speeding over its tracks every day and night, the Pennsylvania Railroad requires many locomotives and passenger and freight cars. Likewise, the extent of its lines and the variety and scope of its services necessitate locomotives and cars of many types.

On January 1, 1939, the rolling stock of the Pennsylvania Railroad comprised the following:

EQUIPMENT	Number Owned by PRR System	% of Total All Class 1 Railroads
Locomotive (Steam and Electric)	4,753	10.6
Passenger Cars	6,499*	16.2
Freight Cars	238,101	13.4

\*Does not include Pullman cars operated on P.R.R.

With the famous Tuscan-red color of Pennsylvania Railroad cars, and the

various types of locomotives used to haul them, the Pennsylvania's many patrons are generally familiar. Probably, however, no one is acquainted with them all.

It is hoped, therefore, that this booklet will be of interest to those who wish to know something more about present Pennsylvania Railroad equipment, since it typifies advanced achievements in design and construction, representing the accumulated experience of more than a century of American railroad operation.

## HOW LOCOMOTIVES AND CARS ARE CLASSIFIED

Locomotives are classified in this booklet according to the Whyte system, which is in general use and, in addition, the Pennsylvania Railroad classifications are shown.

The Whyte system is based on the representation by numerals of the number and arrangement of the wheels, beginning at the front. For example, a Pacific type locomotive with a four-wheeled leading truck, three pairs of driving wheels and two trailing wheels is designated as a 4-6-2 type.

In the Pennsylvania classifications, locomotives are grouped in typical classes according to the wheel arrangement, using a primary letter to designate the type. Successive designs of a type are

designated by numerals following the primary class letter. The suffix "s" after the numeral indicates that the locomotive is equipped with superheater. Use of the suffix "s" has been discontinued on locomotives of the most recent designs, although the superheater is employed.

In the classification of cars, the different types are designated by primary letters, and the successive designs of a type by numerals following the primary letters, modifications in a design being indicated by a small suffix letter. Passenger train cars designed to be equipped with electric motors are designated by the letter "M," placed before the primary letter or letters.



**STEAM PASSENGER LOCOMOTIVE**

For the lighter passenger service.

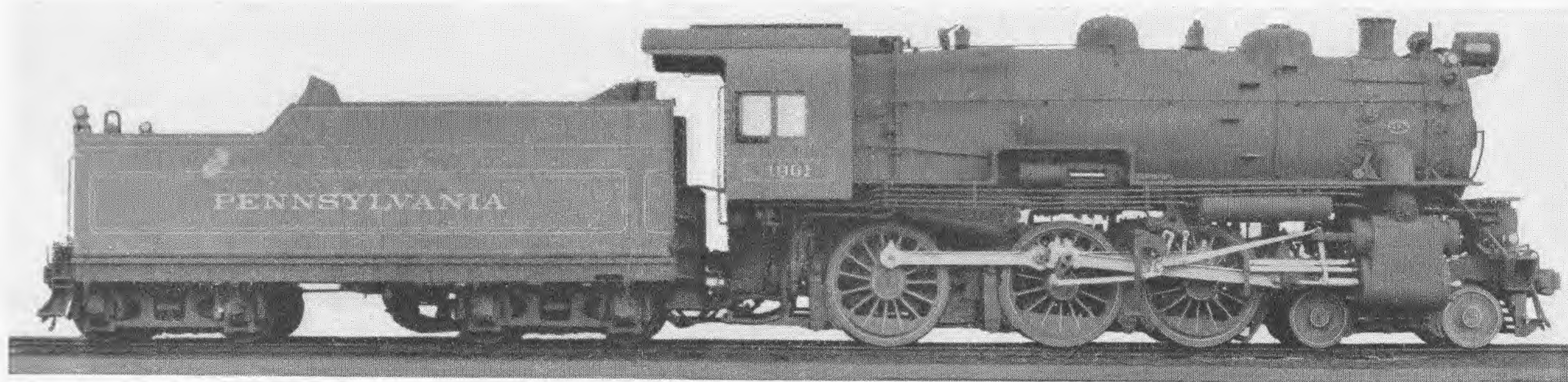
Atlantic (4-4-2) Type

Cylinders, 23½-inch diameter, 26-inch stroke  
 Steam Pressure, 205 pounds per square inch  
 Driving Wheel Diameter . . . . . 80 inches  
 Weight on Driving Wheels . 136,000 pounds

Class E-6s

Total Weight of Locomotive and Tender  
 in Working Order, 411,250 pounds

Tractive Effort . . . 31,275 pounds



**STEAM PASSENGER LOCOMOTIVE**

For local passenger service.

Ten-Wheel (4-6-0) Type

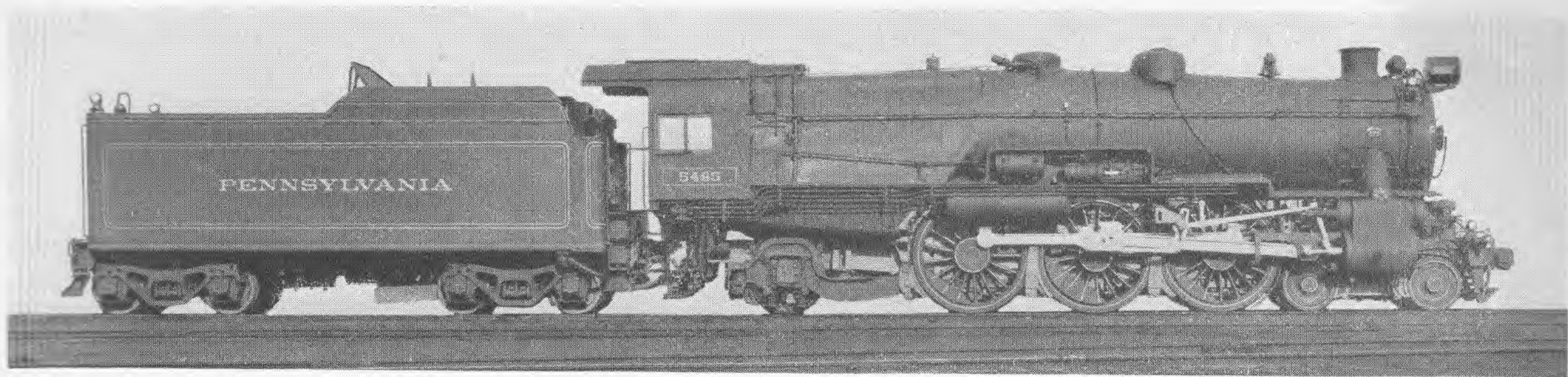
Cylinders, 24-inch diameter, 28-inch stroke  
 Steam Pressure, 205 pounds per square inch  
 Driving Wheel Diameter . . . . . 68 inches  
 Weight on Driving Wheels . 178,000 pounds

Class G-5s

Total Weight of Locomotive and Tender  
 in Working Order, 409,900 pounds

Tractive Effort . . . 41,328 pounds





**STEAM PASSENGER LOCOMOTIVE**  
For high-speed through passenger service.

Pacific (4-6-2) Type  
Cylinders, 27-inch diameter, 28-inch stroke  
Steam Pressure . . . 205 pounds per square inch  
Driving Wheel Diameter . . . . . 80 inches  
Weight on Driving Wheels, 209,300 pounds

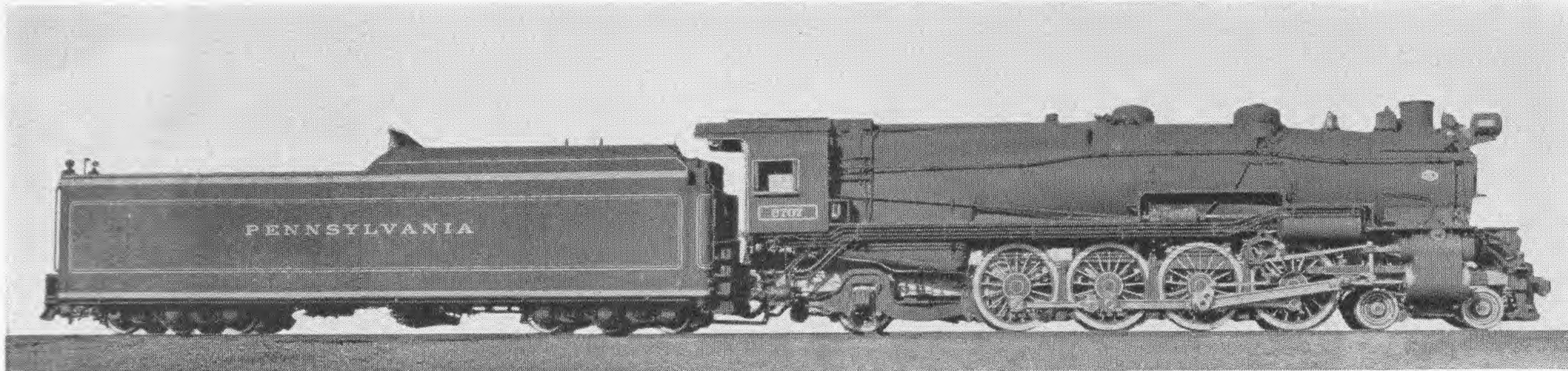
Class K-4s  
Total Weight of Locomotive and Tender  
in Working Order, 541,150 pounds  
Tractive Effort . . . . 44,460 pounds



**STEAM PASSENGER LOCOMOTIVE**  
For high-speed through passenger service.

Pacific (4-6-2) Type  
Cylinders, 27-inch diameter, 28-inch stroke  
Steam Pressure, 205 pounds per square inch  
Driving Wheel Diameter . . . . . 80 inches  
Weight on Driving Wheels, 223,000 pounds

Class K-4s Streamlined  
Total Weight of Locomotive and Tender  
in Working Order, 630,000 pounds  
Tractive Effort . . . . 44,460 pounds



**STEAM PASSENGER OR FREIGHT  
LOCOMOTIVE**

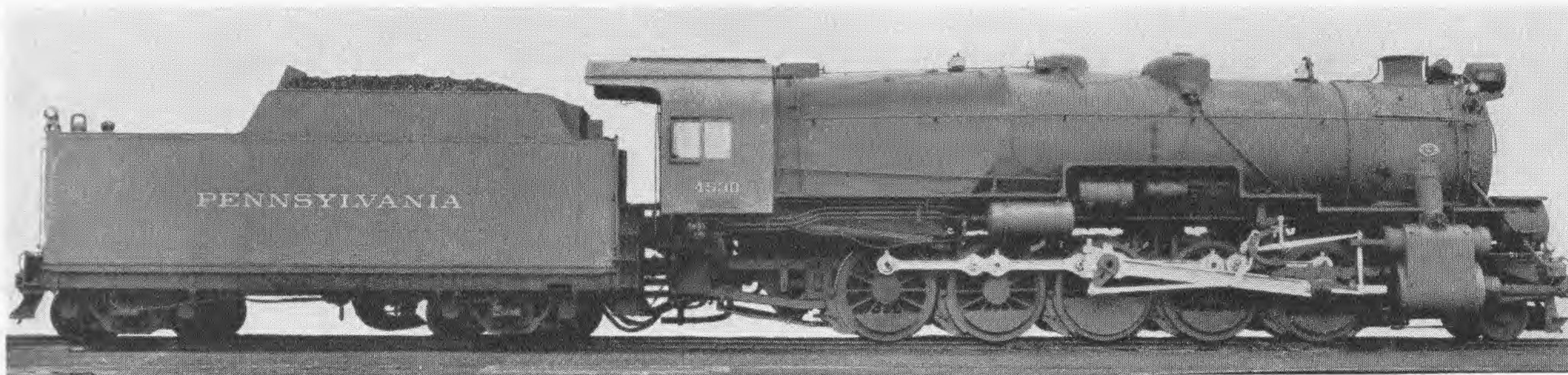
For heavy through passenger  
service or fast freight service.

Mountain (4-8-2) Type

Cylinders: 27-inch diameter, 30-inch stroke  
Steam Pressure . . 250 pounds per square inch  
Driving Wheel Diameter . . . . . 72 inches  
Weight on Driving Wheels, 271,000 pounds

Class M-1a

Total Weight of Locomotive and Tender  
in Working Order, 768,360 pounds  
Tractive Effort . . . . 64,550 pounds



**STEAM FREIGHT LOCOMOTIVE**

For the heaviest freight service.

Decapod (2-10-0) Type

Cylinders: 30 1/2-inch diameter, 32-inch stroke  
Steam Pressure . . 250 pounds per square inch  
Driving Wheel Diameter . . . . . 62 inches  
Weight on Driving Wheels . 352,500 pounds

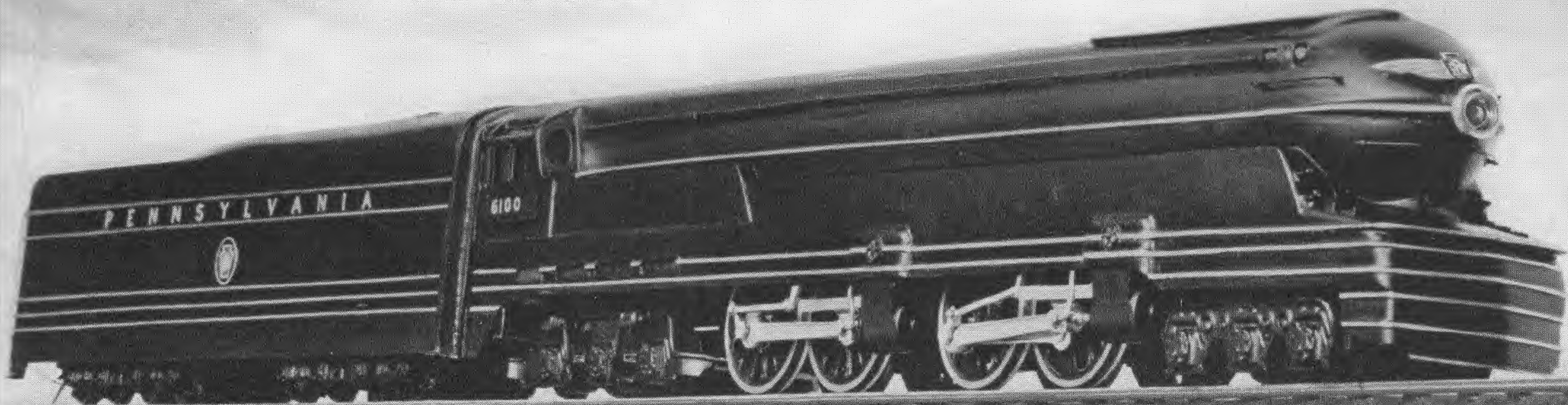
Class I-1s

Total Weight of Locomotive and Tender  
in Working Order, 590,800 pounds  
Tractive Effort . . . . 90,000 pounds

## STEAM PASSENGER LOCOMOTIVE

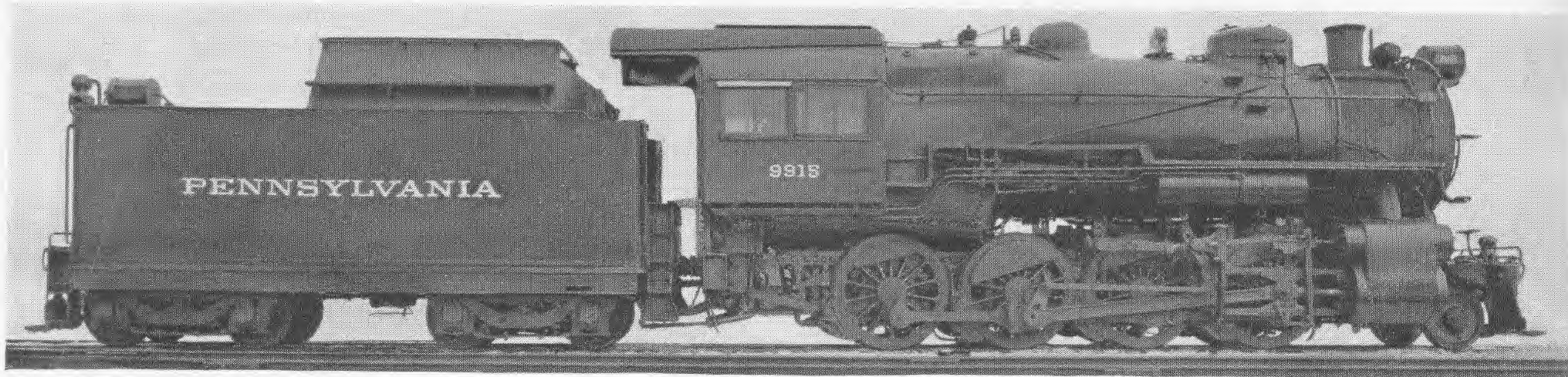
For high-speed through  
passenger service.

Pennsylvania (6-4-4-6) Type	Class S-1
Cylinders—4 . . . . .	22-inch diameter, 26-inch stroke
Steam Pressure . . . . .	300 pounds per square inch
Driving Wheel Diameter . . . . .	84 inches
Weight on Driving Wheels . . . . .	270,000 pounds
Total Weight of Locomotive and Tender in Working Order . . . . .	1,052,200 pounds
Tractive Effort . . . . .	76,400 pounds



Designed to combine power, speed and economy of operation to a degree never before achieved, the fully streamlined new Class S-1 is expected to anticipate steam locomotive development for years to come. In distinction from more conventional types, it is equipped with four cylinders instead of

two, each pair of cylinders providing power for two pairs of driving wheels. This locomotive is the outcome of extensive studies of modern trends in railroad operation and motive power and the requirements of the future. It is capable of sustained speeds of more than 100 miles per hour.



**STEAM FREIGHT LOCOMOTIVE**

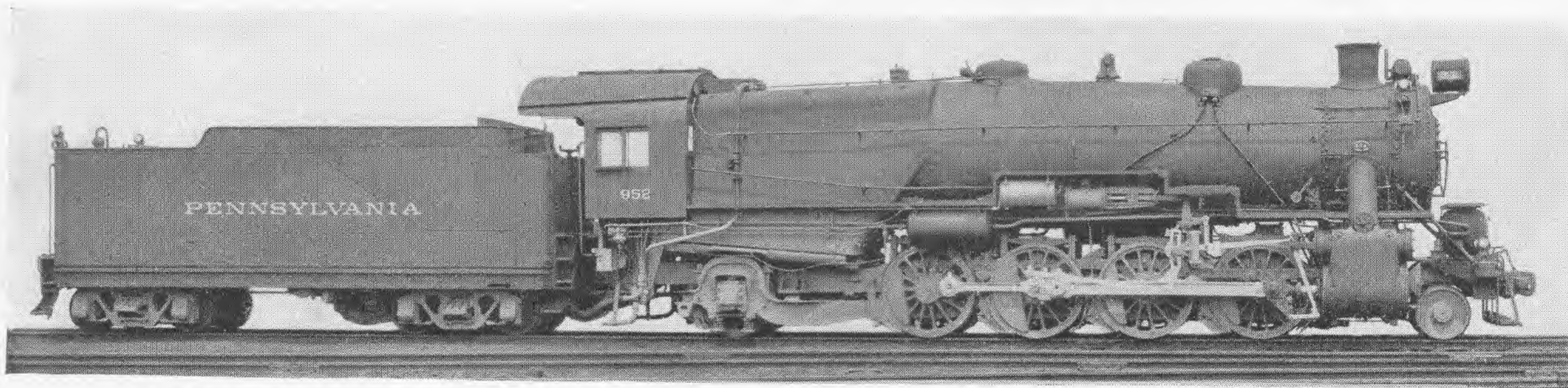
Largely used in local freight and branch line service.

Consolidation (2-8-0) Type

Cylinders: 26-inch diameter, 28-inch stroke  
 Steam Pressure . . 205 pounds per square inch  
 Driving Wheel Diameter . . . . . 62 inches  
 Weight on Driving Wheels . 223,000 pounds

Class H-10s

Total Weight of Locomotive and Tender  
 in Working Order, 424,050 pounds  
 Tractive Effort . . . . . 53,197 pounds



**STEAM FREIGHT LOCOMOTIVE**

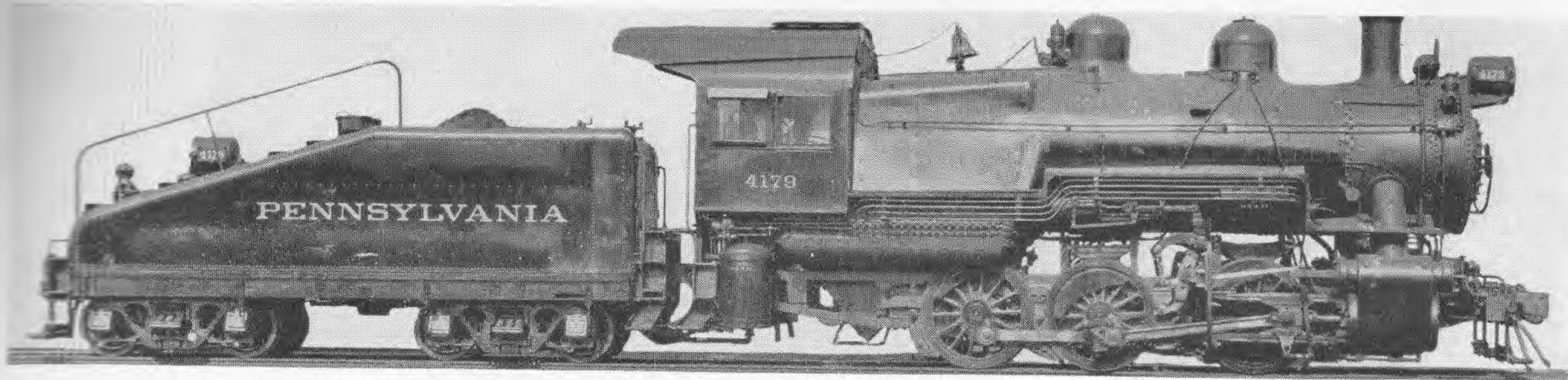
For heavy freight service.

Mikado (2-8-2) Type

Cylinders: 27-inch diameter, 30-inch stroke  
 Steam Pressure . . 205 pounds per square inch  
 Driving Wheel Diameter . . . . . 62 inches  
 Weight on Driving Wheels . 240,200 pounds

Class L-1s

Total Weight of Locomotive and Tender  
 in Working Order, 497,050 pounds  
 Tractive Effort . . . . . 61,465 pounds



**STEAM SWITCHING LOCOMOTIVE**

For general switching service.

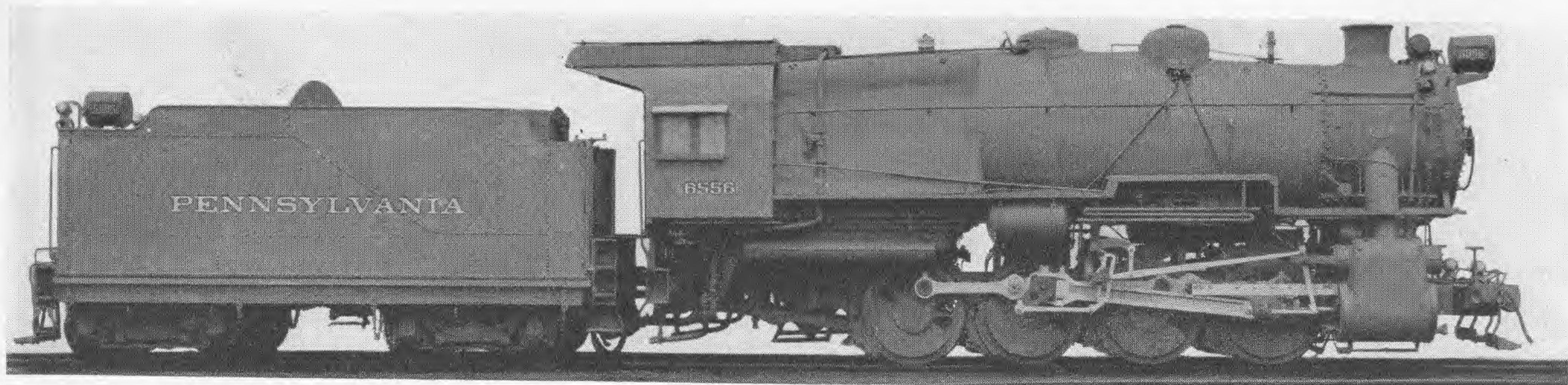
Six-Wheel (0-6-0) Type

Cylinders: 22-inch diameter, 24-inch stroke  
 Steam Pressure . . 205 pounds per square inch  
 Driving Wheel Diameter . . . . . 56 inches  
 Weight on Driving Wheels . 180,300 pounds

Class B-6sb

Total Weight of Locomotive and Tender  
 in Working Order, 305,300 pounds

Tractive Effort . . . . 36,144 pounds



**STEAM SWITCHING LOCOMOTIVE**

For heavy switching and hump service.

Eight-Wheel (0-8-0) Type

Cylinders . . 27-inch diameter, 30-inch stroke  
 Steam Pressure, 250 pounds per square inch  
 Driving Wheel Diameter . . . . . 56 inches  
 Weight on Driving Wheels, 278,000 pounds

Class C-1

Total Weight of Locomotive and Tender  
 in Working Order, 435,250 pounds

Tractive Effort . . . . 76,154 pounds

**ELECTRIC SWITCHING  
LOCOMOTIVE**

For general switching service.

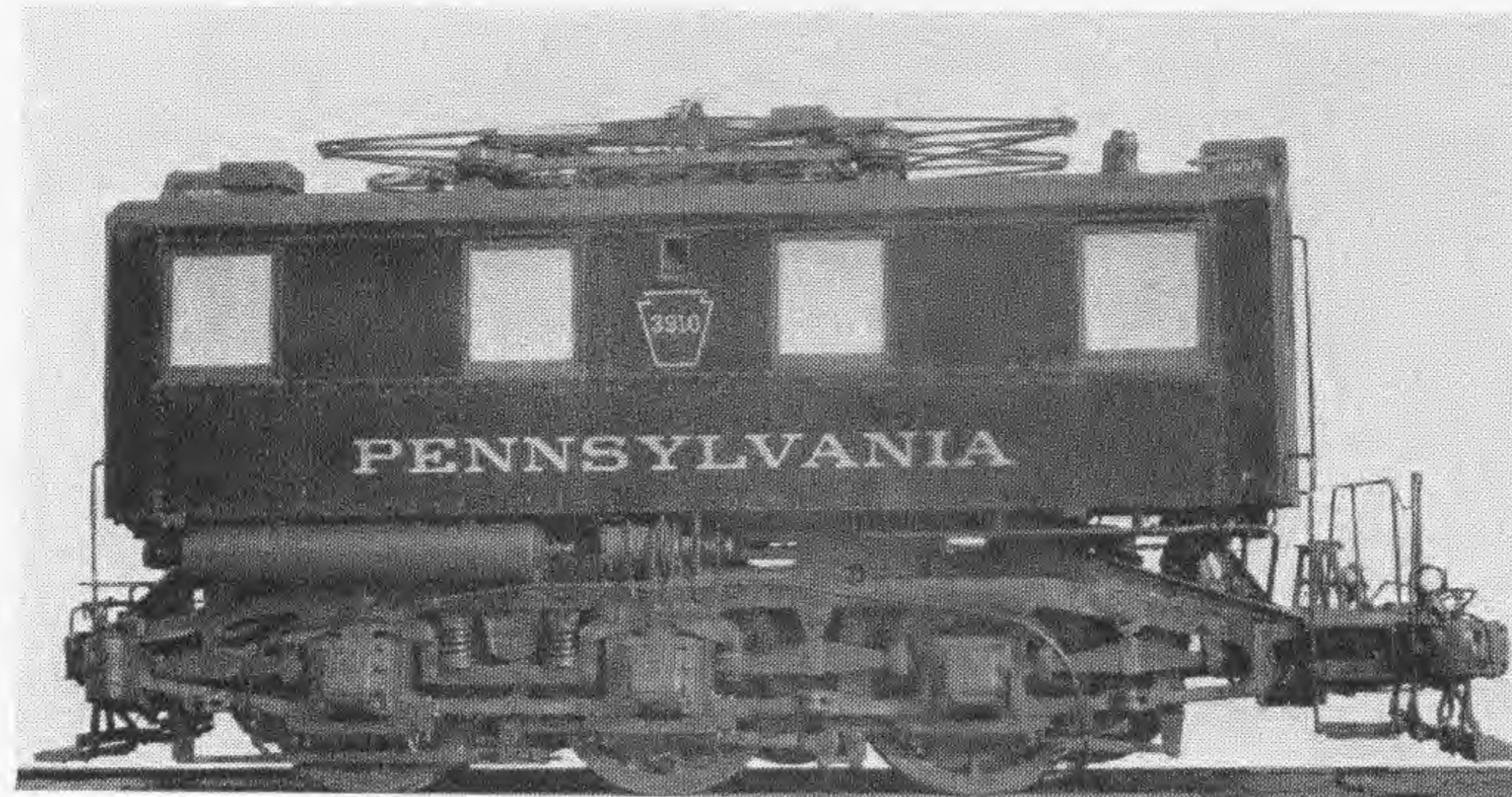
Type (0-6-0)

Class B-1

Driving Wheel Diameter . . . . . 62 inches

Tractive Effort . . . . . 50,000 pounds

Weight on Driving Wheels and  
Total Weight . . . . . 157,045 pounds



**ELECTRIC PASSENGER OR  
FREIGHT LOCOMOTIVE**

For general service.

Type (4-6-4)

Class P-5a

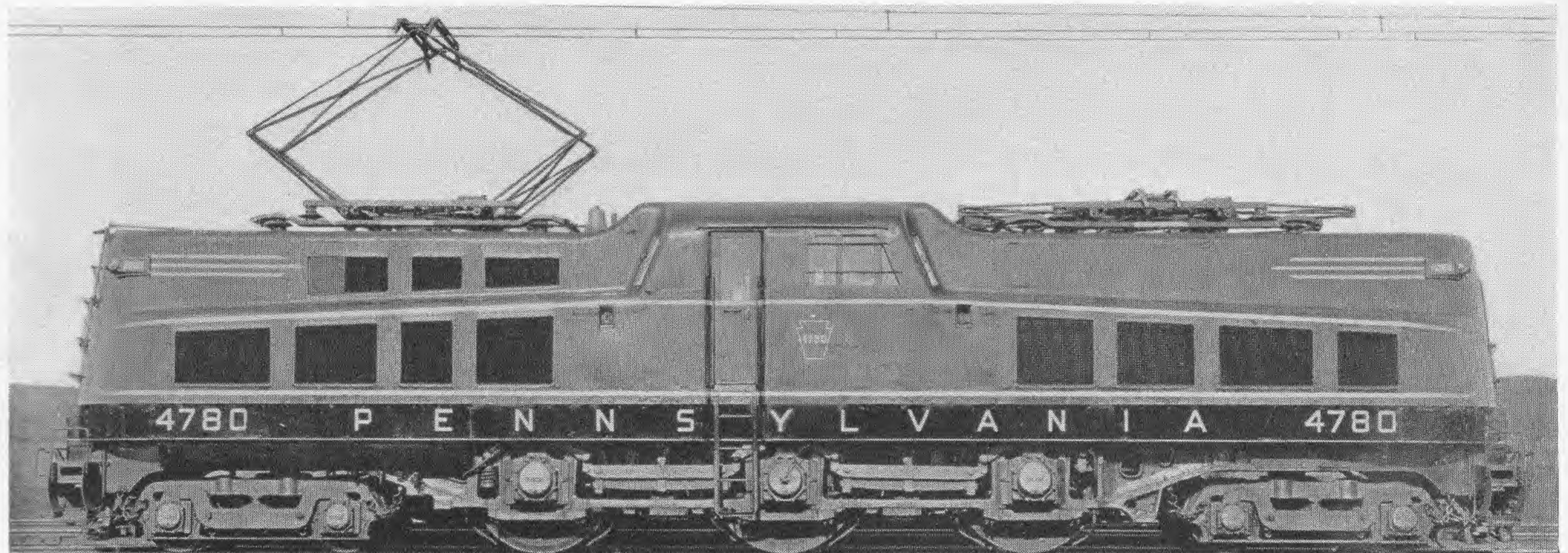
*P-5a built after 5-1-34*

Driving Wheel Diameter . . 72 inches

Weight on  
Driving Wheels . . . 229,000 pounds

Total Weight  
in Working Order . 394,000 pounds

Maximum Tractive  
Effort . . . . . 56,250 pounds



**ELECTRIC PASSENGER LOCOMOTIVE**

For high-speed through passenger service.

Also used in fast freight service.

Type (4-6-0—0-6-4)

Class GG-1

GG-1 built after 1-1-37

Driving Wheel Diameter . . . . . 57 inches

Weight on Driving Wheels . . . . 303,000 pounds

Total Weight in Working Order . . 477,000 pounds

Maximum Tractive Effort . . . . . 72,800 pounds



The Class GG-1 is the most powerful electric passenger locomotive of its type ever built and the first to be streamlined. Primarily designed to meet the requirements of the high-speed passenger service in the electrified territory between New York, Phila-

delphia, Baltimore, Washington and Harrisburg, it is capable of hauling passenger trains at sustained speeds of 90 to 100 miles per hour. In addition, it has proved itself equally adaptable to the high-speed freight service and is extensively so used.



**DIESEL  
ELECTRIC SWITCH-  
ING LOCOMOTIVE**

For switching service.

Class AA-5

Weight on Drivers & Total  
Weight . 200,000 Lbs.

Diameter Drivers . . 40"

Maximum Tractive Effort  
60,000 Lbs.

Engine—Diesel, 8 Cyl.,  
8" x 10", 2 Cycle,  
600 H.P. at 750 R.P.M.

Traction Motors . . . 4



**GAS-ELECTRIC RAIL MOTOR CAR**

For branch line passenger service.



Class GEG-415

Length . . . . . 75' 0"

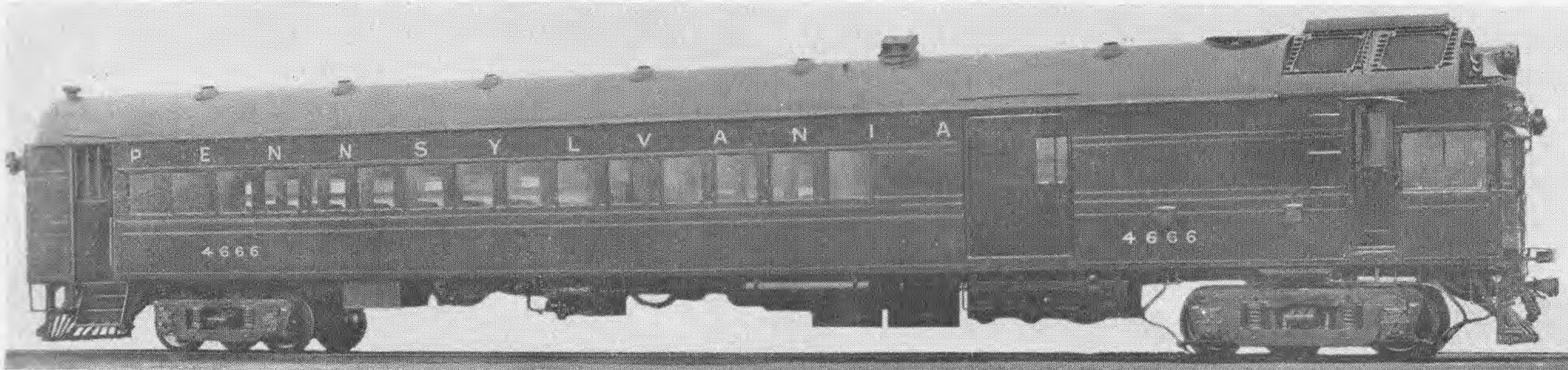
Weight . . . . . 139,500 Lbs.

Seating Capacity . . . . . 66

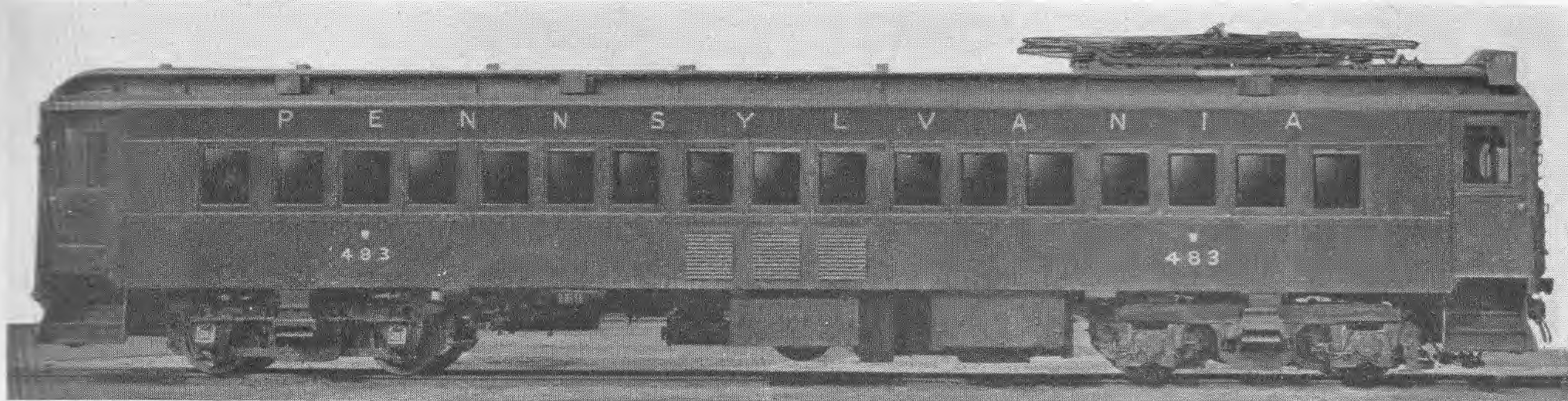
Engine—4-Cycle, 6 Cyl., 8 $\frac{3}{4}$ " x 10 $\frac{1}{2}$ ",  
Rated 415 H.P.

Generator Rated Capacity . . 336 K.W.

Traction Motors, 2—Rated 220 H.P. each







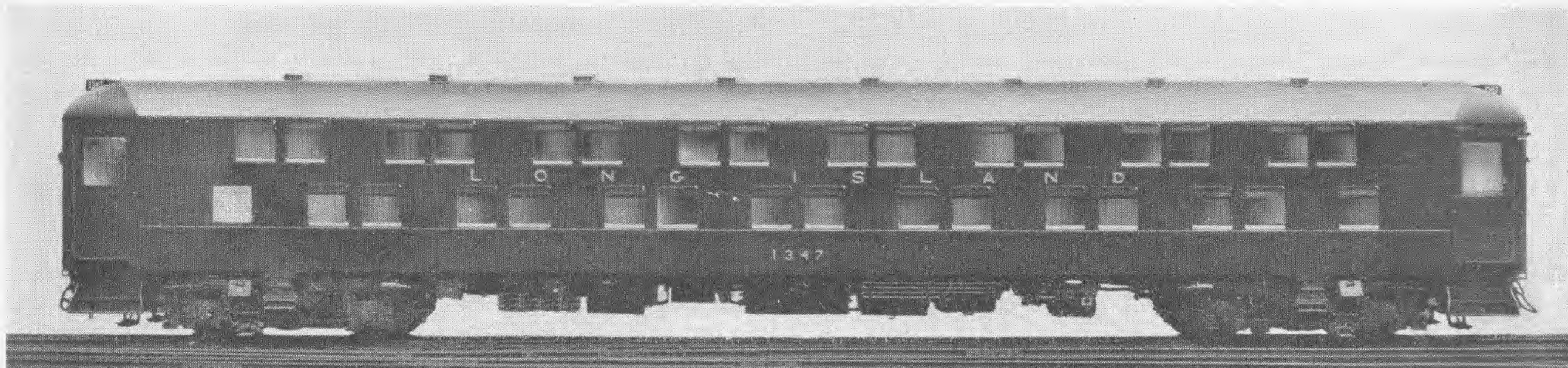
**COACH (ELECTRIC)**

For multiple-unit operation in suburban and local trains.

Class MP-54E3

Length of body, inside . . . . .	53' 7 <sup>3</sup> / <sub>8</sub> "	Seating capacity . . . . .	72
Width of body, inside . . . . .	9' 1 <sup>1</sup> / <sub>8</sub> "	Weight . . . . .	127,000 lbs.
Length of car, coupled . . . . .	64' 0 <sup>1</sup> / <sub>2</sub> "		

Without electrical equipment, used in local steam trains—weight 90,000 lbs.



**COACH, DOUBLE DECK (ELECTRIC)**

For multiple-unit operation in suburban service.

Class MP-70

Length of body, inside . . . . .	69' 5 <sup>1</sup> / <sub>2</sub> "	Capacity—passengers . . . . .	134
Width of body, inside . . . . .	9' 3"	Weight . . . . .	120,800 lbs.
Length of car, coupled . . . . .	80' 3 <sup>1</sup> / <sub>4</sub> "		

All-aluminum construction. Forced air ventilation.  
Semi permanently coupled to trailer car of same construction.  
Weight of trailer car—94,200 lbs.



**COACH**

For through service.

Class P-82R

Length of body, inside . . . . .	78' 6"	Seating capacity . . . . .	66
Width of body, inside . . . . .	9' 3 $\frac{1}{8}$ "	Weight . . . . .	105,000 lbs.
Length of car, coupled . . . . .	84' 8"	Air-conditioned	



**COMBINED PASSENGER AND  
BAGGAGE CAR**

For general service.

Class PB-70DR

Length of body, inside . . . . .	70' 4 $\frac{1}{4}$ "	Seating capacity . . . . .	44
Width of body, inside . . . . .	9' 1 $\frac{1}{8}$ "	Baggage capacity . . . . .	35,000 Lbs.
Length of car, coupled . . . . .	77' 3 $\frac{1}{2}$ "	Weight . . . . .	145,570 Lbs.

Passenger compartment air-conditioned.



**DINING CAR**  
For general service.

Class D-82R

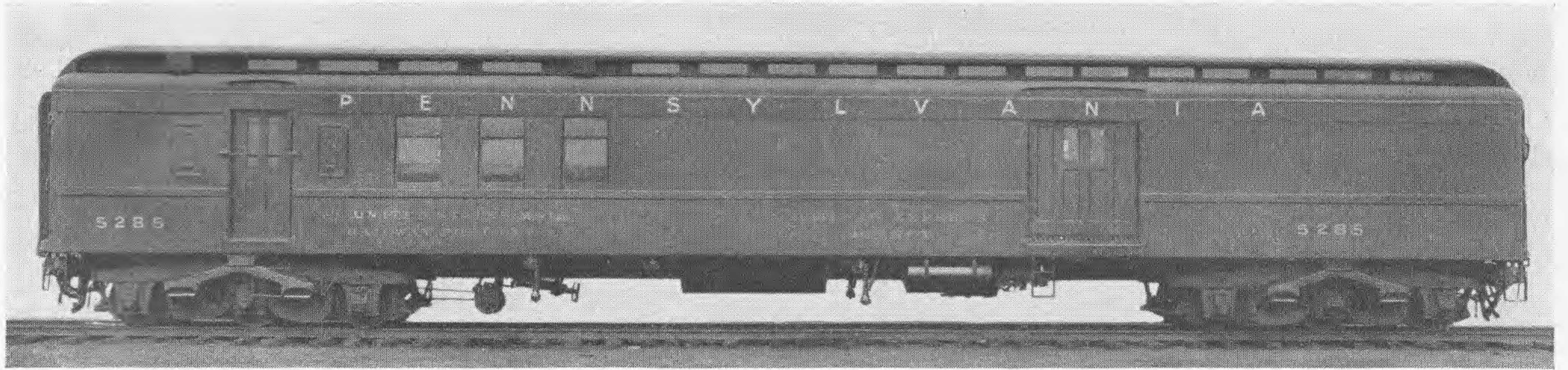
Length of body, inside . . . . .	82' 0"	Seating capacity . . . . .	44
Width of body, inside . . . . .	9' 3 <sup>3</sup> / <sub>8</sub> "	Weight . . . . .	113,000 Lbs.
Length of car, coupled . . . . .	84' 8"	Air-conditioned	



**MAIL CAR**  
For general service.

Class M-70B

Length of body, inside . . . . .	70' 9 <sup>1</sup> / <sub>4</sub> "	Capacity . . . . .	30,000 Lbs.
Width of body, inside . . . . .	9' 1"	Weight . . . . .	125,000 Lbs.
Length of car, coupled . . . . .	74' 4 <sup>1</sup> / <sub>2</sub> "		



**BAGGAGE AND MAIL CAR**

For general service.

Class BM-70K

Length of body, inside . . . .	70' 9 $\frac{1}{8}$ "	Capacity Baggage	
Width of body, inside . . . .	9' 1"	Compartment . . . . .	40,000 Lbs.
Length of car, coupled . . . .	74' 4 $\frac{1}{2}$ "	Weight . . . . .	132,300 Lbs.

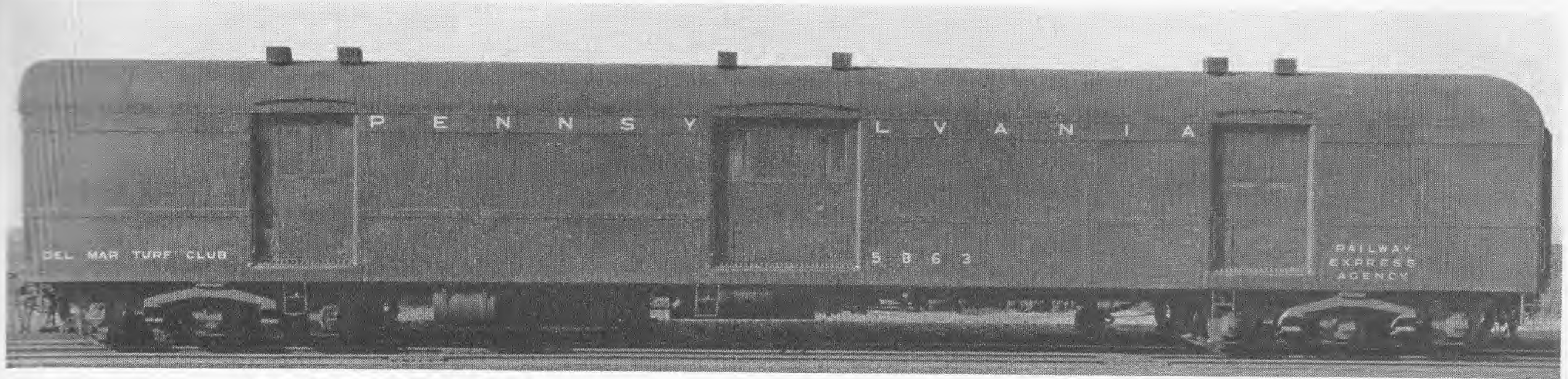


**EXPRESS CAR**

For general service.

Class B-60B

Length of body, inside . . . .	60' 0"	Capacity . . . . .	60,000 Lbs.
Width of body, inside . . . .	9' 8 $\frac{1}{4}$ "	Weight . . . . .	101,300 Lbs.
Length of car, coupled . . . .	63' 2"		

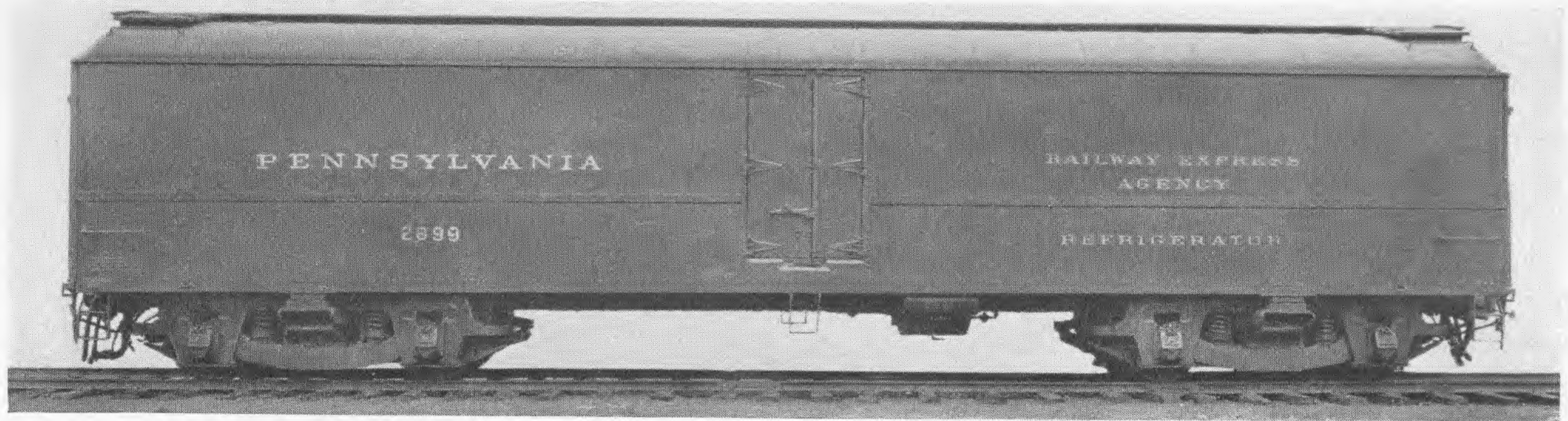


**HORSE EXPRESS CAR**

For race and other valuable horses.  
 Electric light, steam heat, adjustable stalls.  
 Large end doors for loading vehicles.

**Class B-74B**

Length of body, inside . . . . .	73' 8 <sup>1</sup> / <sub>8</sub> "	Capacity . . . . .	65,000 Lbs.
Width of body, inside . . . . .	9' 3"	Capacity . . . . .	24 Horses
Length of car, coupled . . . . .	77' 9 <sup>1</sup> / <sub>4</sub> "	Weight . . . . .	132,000 Lbs.

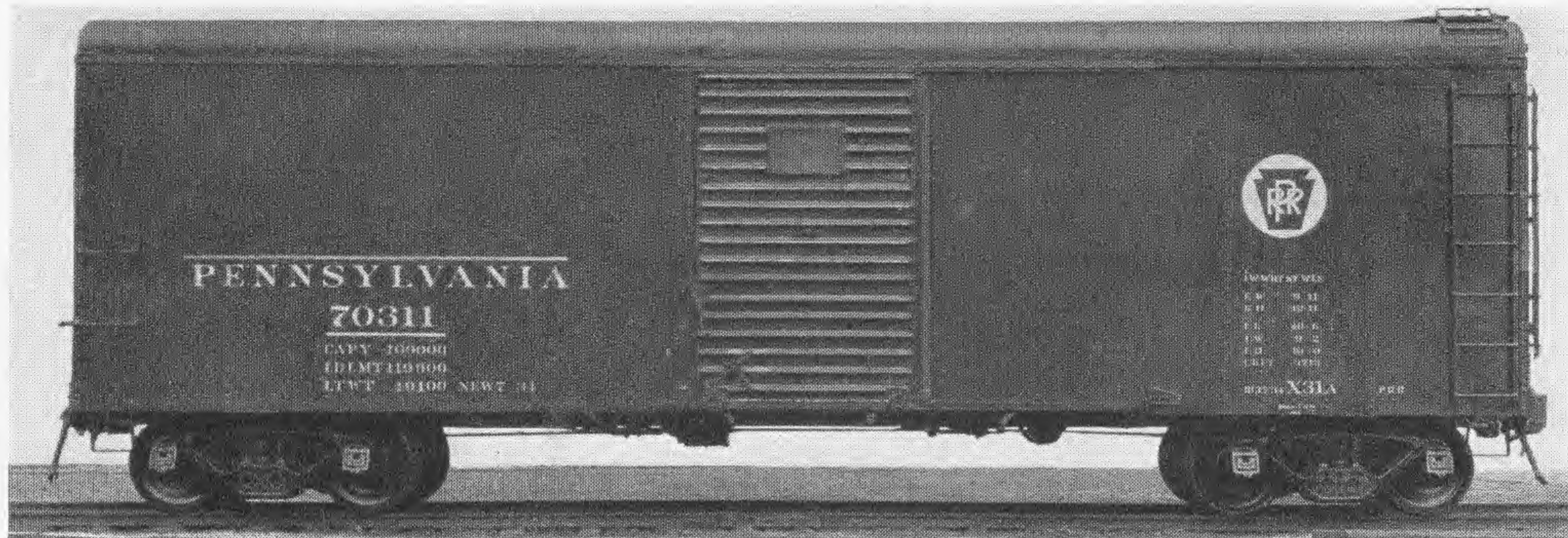


**REFRIGERATOR EXPRESS CAR**

For milk, fruit and other  
 perishable products.

**Class R-50B**

Length of body inside between bulkheads . . . . .	42' 5"	Capacity . . . . .	40,000 Lbs.
Length of car, coupled . . . . .	54' 2"	Weight . . . . .	95,000 Lbs.



**BOX CAR**

For general merchandise  
and grain.  
All steel, wood lined, single  
door, 6' 0" opening.

**Class X-31A**

Length of body, inside . . . . . 40' 6"  
Length of car, coupled . . . . . 44' 2 1/8"  
Capacity . . . . . 100,000 Lbs.  
Weight of car . . . . . 49,100 Lbs.

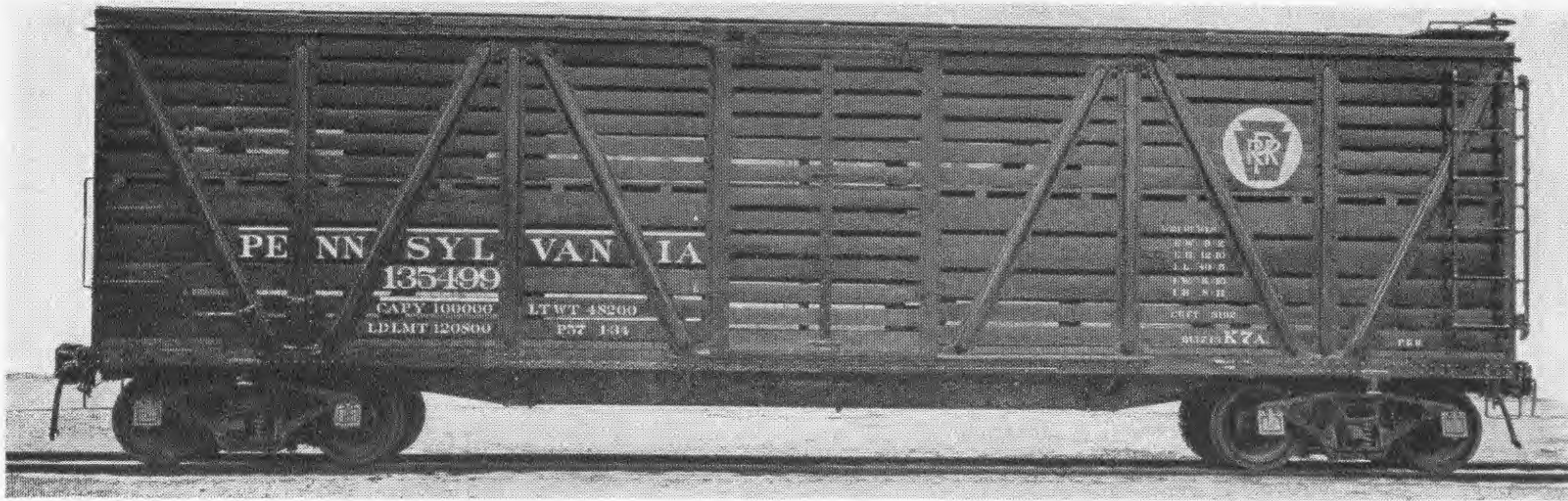


**AUTOMOBILE BOX CAR**

For motor vehicles and bulky  
merchandise.  
All steel, wood lined, double  
doors, 14' 6" opening.

**Class X-32A**

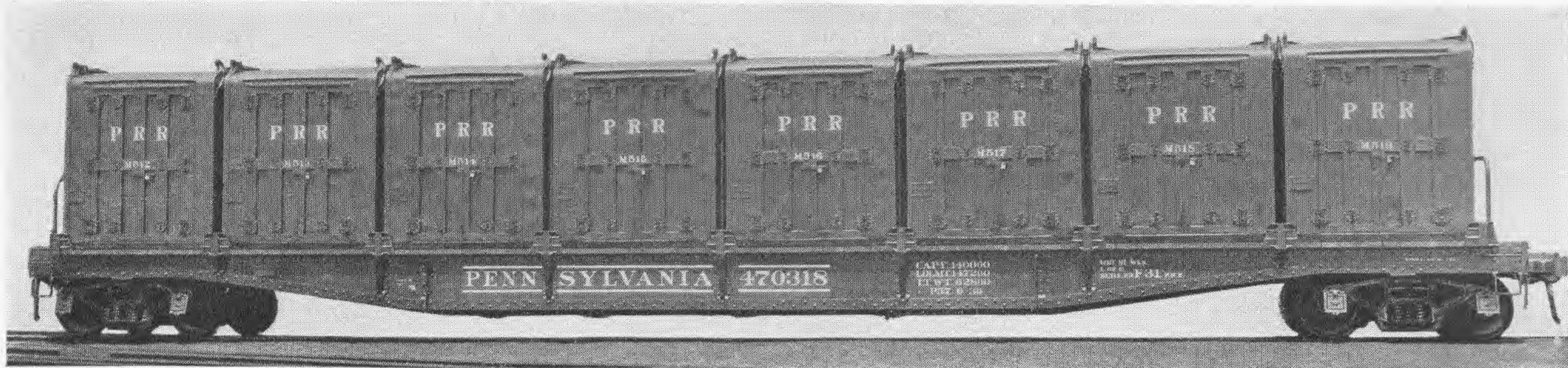
Length of body, inside . . . . . 50' 6"  
Length of car, coupled . . . . . 54' 2 1/8"  
Capacity . . . . . 100,000 Lbs.  
Weight . . . . . 56,100 Lbs.



**STOCK CAR**

For cattle and other livestock.  
Steel framed, wood lined,  
all-steel roof, single door,  
6' 1" opening.

	Class K-7A
Length of body, inside . . . . .	40' 5 1/2"
Length of car, coupled . . . . .	44' 6"
Capacity . . . . .	100,000 Lbs.
Weight of car . . . . .	48,200 Lbs.



**FLAT CAR**

Steel frame—wood floor.  
For merchandise container  
service.

	Class F-31
Length of body . . . . .	62' 6 1/2"
Length of car, coupled . . . . .	66' 0"
Load limit . . . . .	147,200 Lbs.
Weight of car . . . . .	62,800 Lbs.
8 merchandise, all-steel, weatherproof containers, Class DD-1A	
Weight 2900 Lbs.—Load limit 12,000 Lbs.—Capacity 440 cu. ft.	



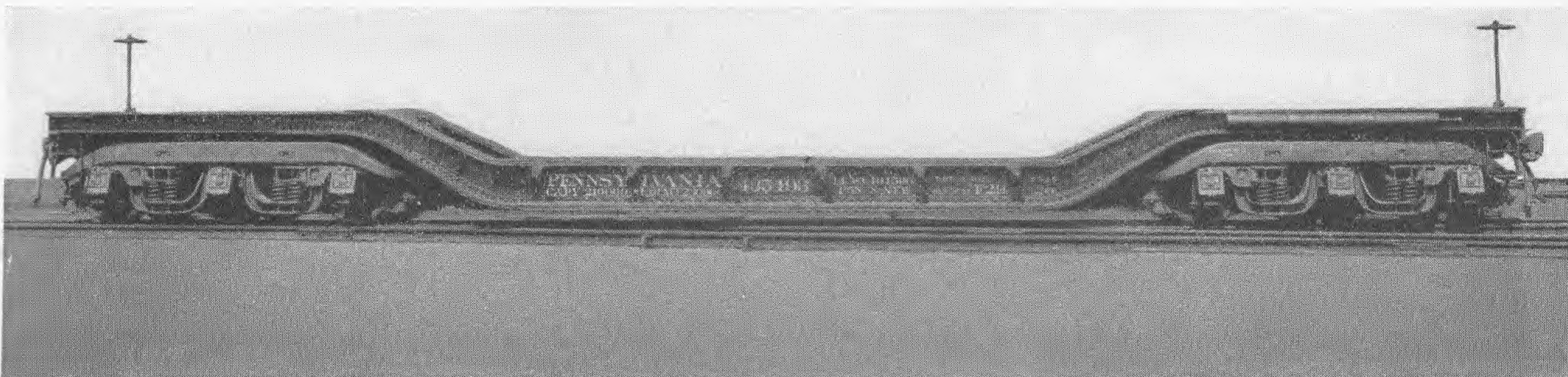
**GONDOLA CAR**

All steel.

For bulk commodity container service.

Class G-22B

Length of body, inside . . . . .	46' 2 1/2"	Capacity . . . . .	200,000 Lbs.
Length of car, coupled . . . . .	50' 6"	Weight of car . . . . .	46,700 Lbs.
12 bulk commodity, all-steel, weatherproof containers, Class HB-1—controlled discharge. Weight 2950 Lbs.—Load limit 16,000 Lbs.—Capacity 148 cu. ft.			



**DEPRESSED FLAT CAR**

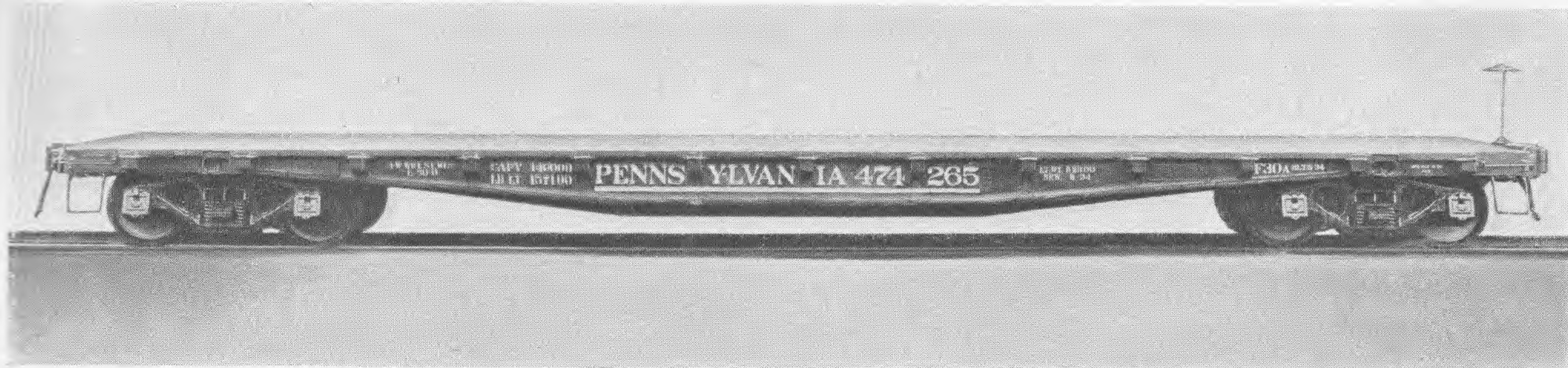
All steel.

For large heavy shipments.

Class F-29

Length of body . . . . .	52' 6"	Load limit . . . . .	230,000 Lbs.
Length of car, coupled . . . . .	55' 0"	Weight . . . . .	101,500 Lbs.
Length of depressed floor . . . . .	20' 0"	Top of rail to top of depressed floor,	2' 3 3/4"



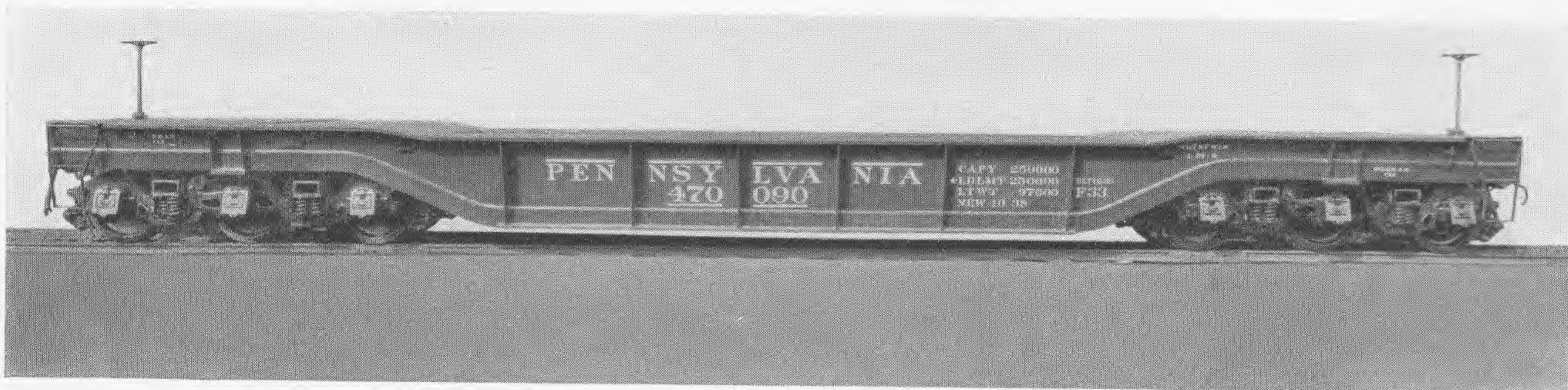


**FLAT CAR**

Cast steel frame — wood floor.

Class F-30A

Length of body . . . . .	48' 4"	Load limit . . . . .	157,100 Lbs.
Length of car, coupled . . . . .	52' 6"	Weight . . . . .	52,900 Lbs.

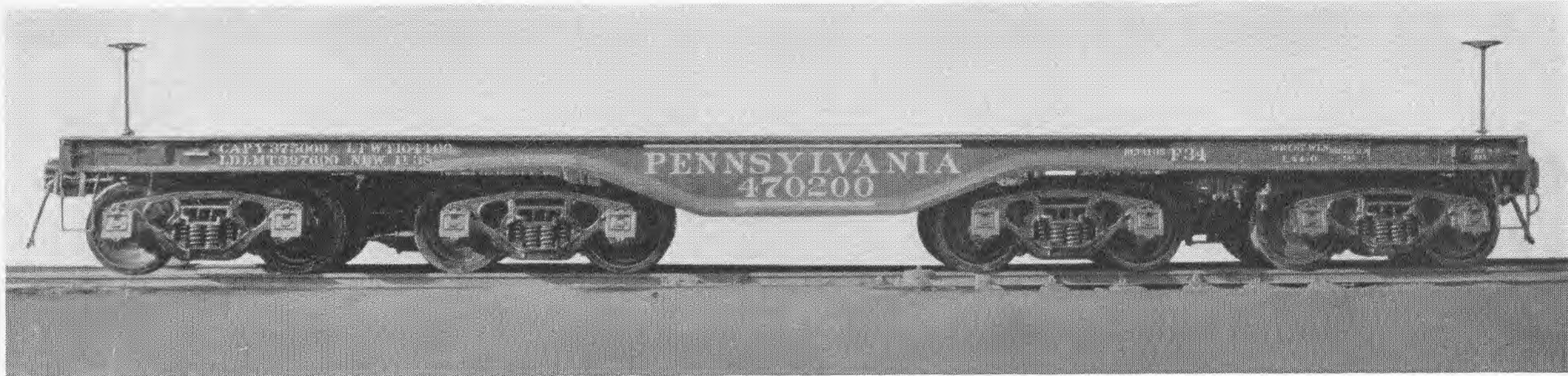


**HEAVY DUTY WELL CAR**

All steel — wood floor in depressed well.  
For shipments of unusual size and weight.

Class F-33

Length of body . . . . .	51' 6 <sup>3</sup> / <sub>4</sub> "	Load limit . . . . .	250,000 Lbs.
Length of car, coupled . . . . .	55' 2"	Weight . . . . .	97,600 Lbs.
Length of well . . . . .	25' 2"	Top of rail to top of well floor . . .	1' 8"
Width of well . . . . .	7' 8"		

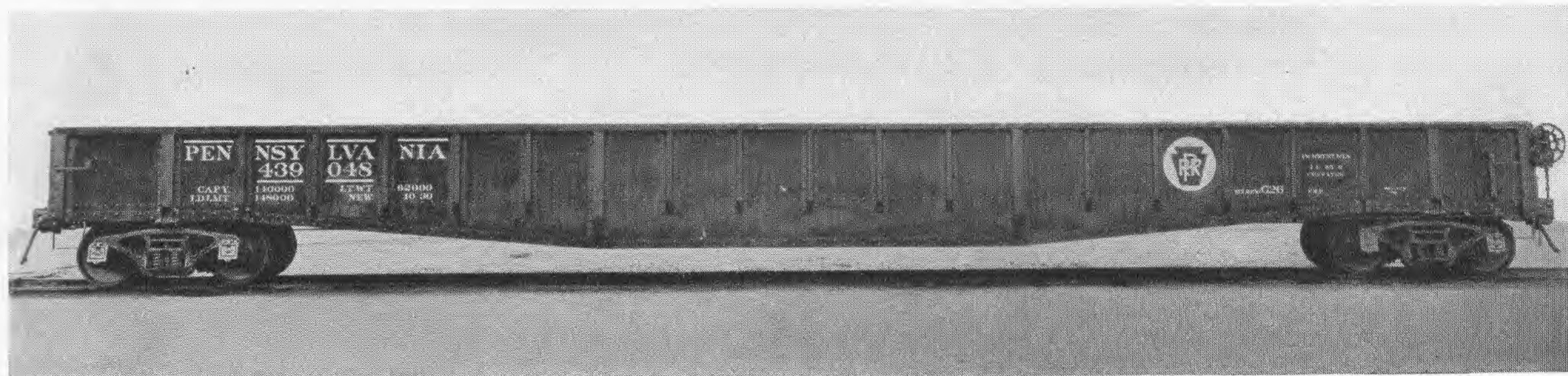


**HEAVY DUTY FLAT CAR**

Cast steel frame, steel floor.  
For shipments of the heaviest character.

Class F-34

Length of body . . . . .	44' 0"	Load limit . . . . .	397,600 Lbs.
Length of car, coupled . . . . .	47' 6 $\frac{1}{4}$ "	Weight . . . . .	104,400 Lbs.

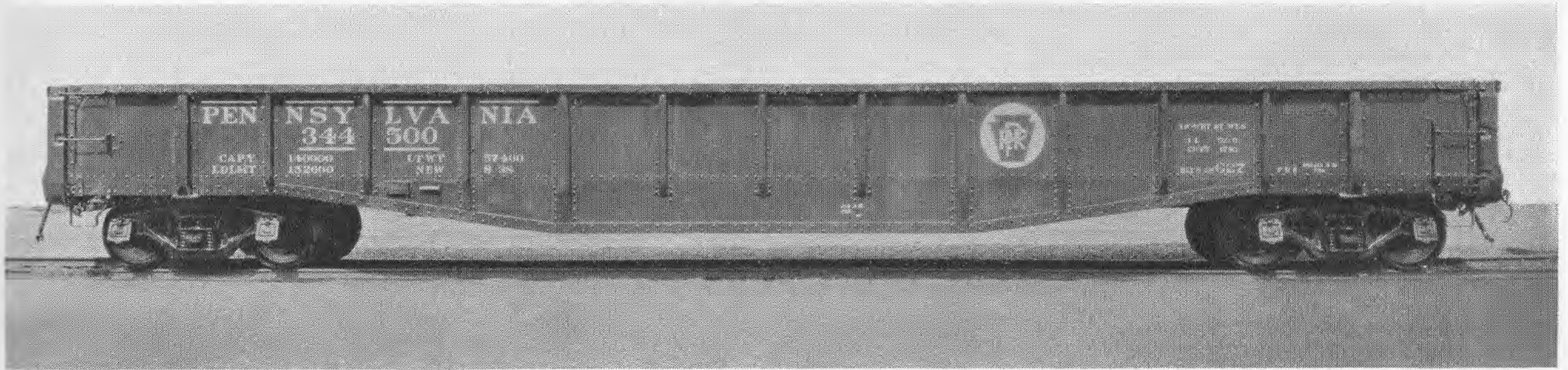


**MILL TYPE GONDOLA CAR**

All steel. Drop ends.  
For shipments of unusual length.

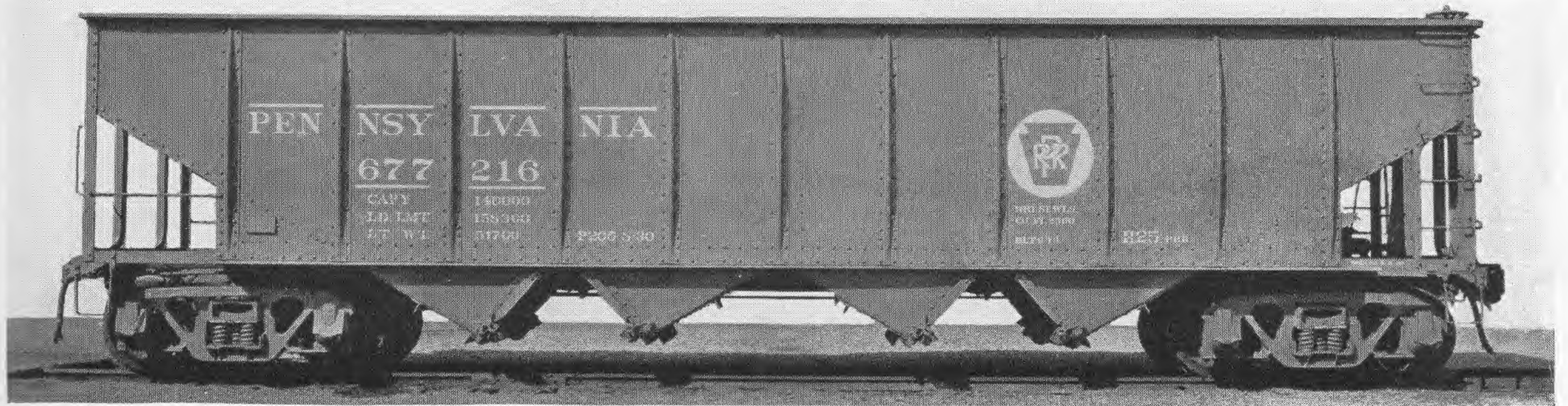
Class G-26

Length of body, inside . . . . .	65' 6"	Capacity . . . . .	140,000 Lbs.
Length of car, coupled . . . . .	70' 3"	Weight . . . . .	62,000 Lbs.



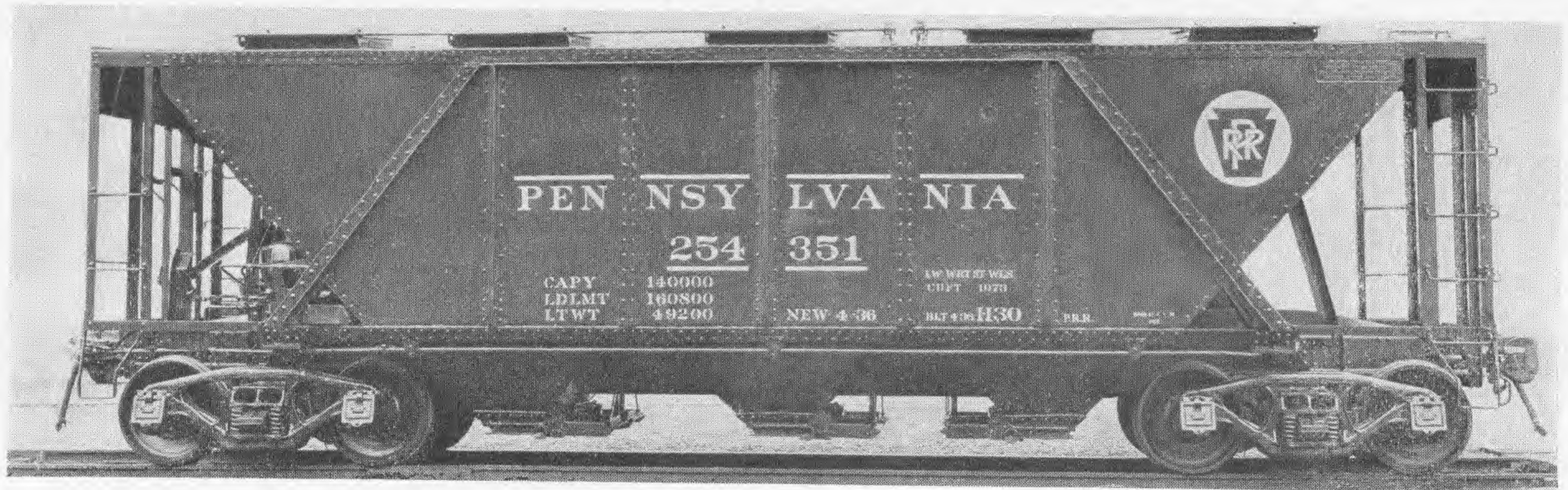
**MILL TYPE GONDOLA CAR**  
 All steel. Drop ends.  
 For pipe, structural shapes, etc.

	Class G-27	
Length of body, inside . . . . .	52' 6"	Capacity . . . . . 140,000 Lbs.
Length of car, coupled . . . . .	57' 3"	Weight . . . . . 57,400 Lbs.



**HOPPER CAR**  
 All steel.  
 For coal, ore and other heavy bulk commodities.

	Class H-25	
Length of body, inside . . . . .	40' 2"	Capacity . . . . . 140,000 Lbs.
Length of body, coupled . . . . .	44' 5½"	Weight . . . . . 51,700 Lbs.



**COVERED HOPPER CAR**

All steel, 3 compartments, 10 roof hatches, 6 hoppers. For bulk commodities to be kept dry.

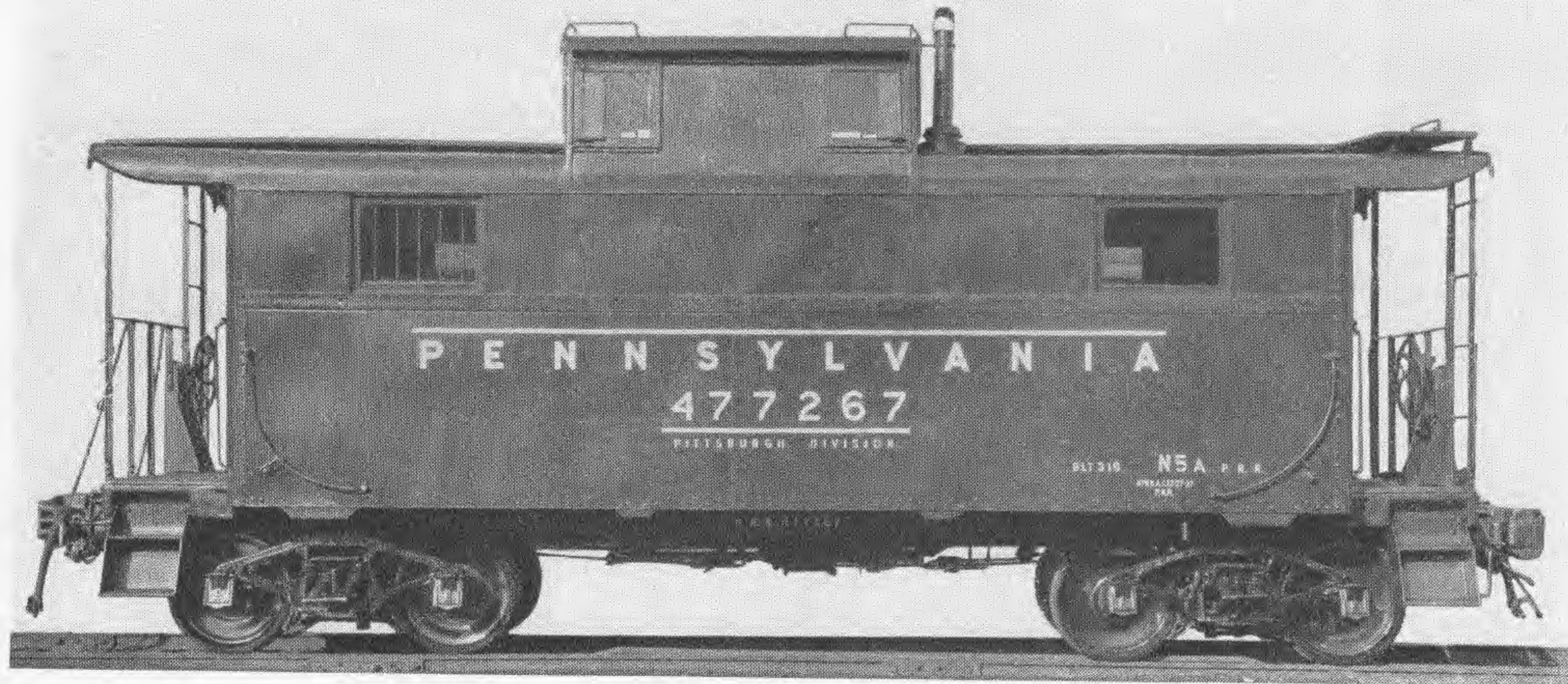
Class H-30

Length of body, inside . . . 31' 0"

Length of car, coupled . . . 39' 6"

Capacity . . . . . 140,000 Lbs.

Weight . . . . . 49,200 Lbs.



**CABIN CAR**

Insulated steel body.

Class N-5A

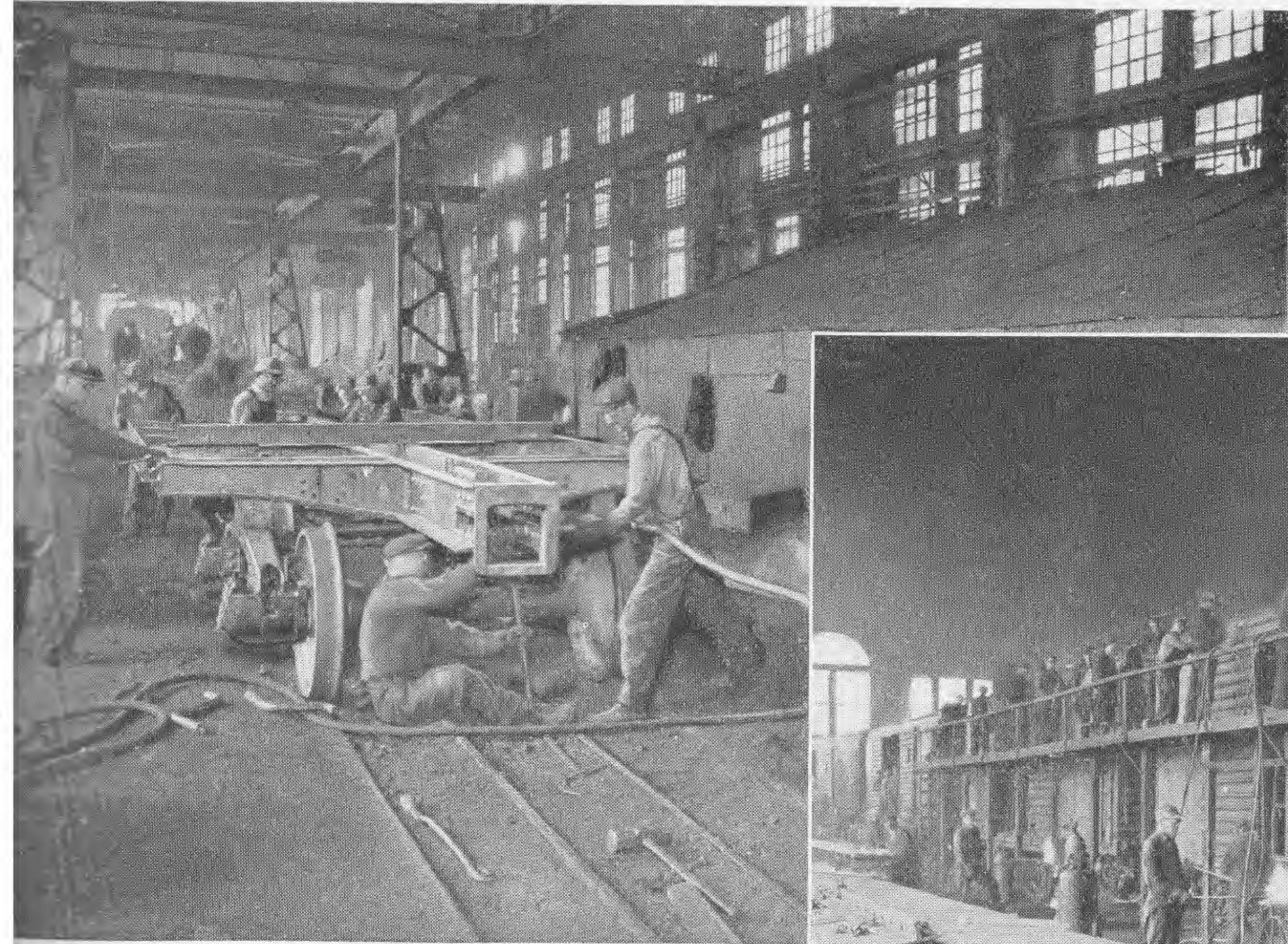
Length of body, inside . . 23' 3<sup>3</sup>/<sub>4</sub>"

Length of car, coupled . . 34' 11<sup>1</sup>/<sub>2</sub>"

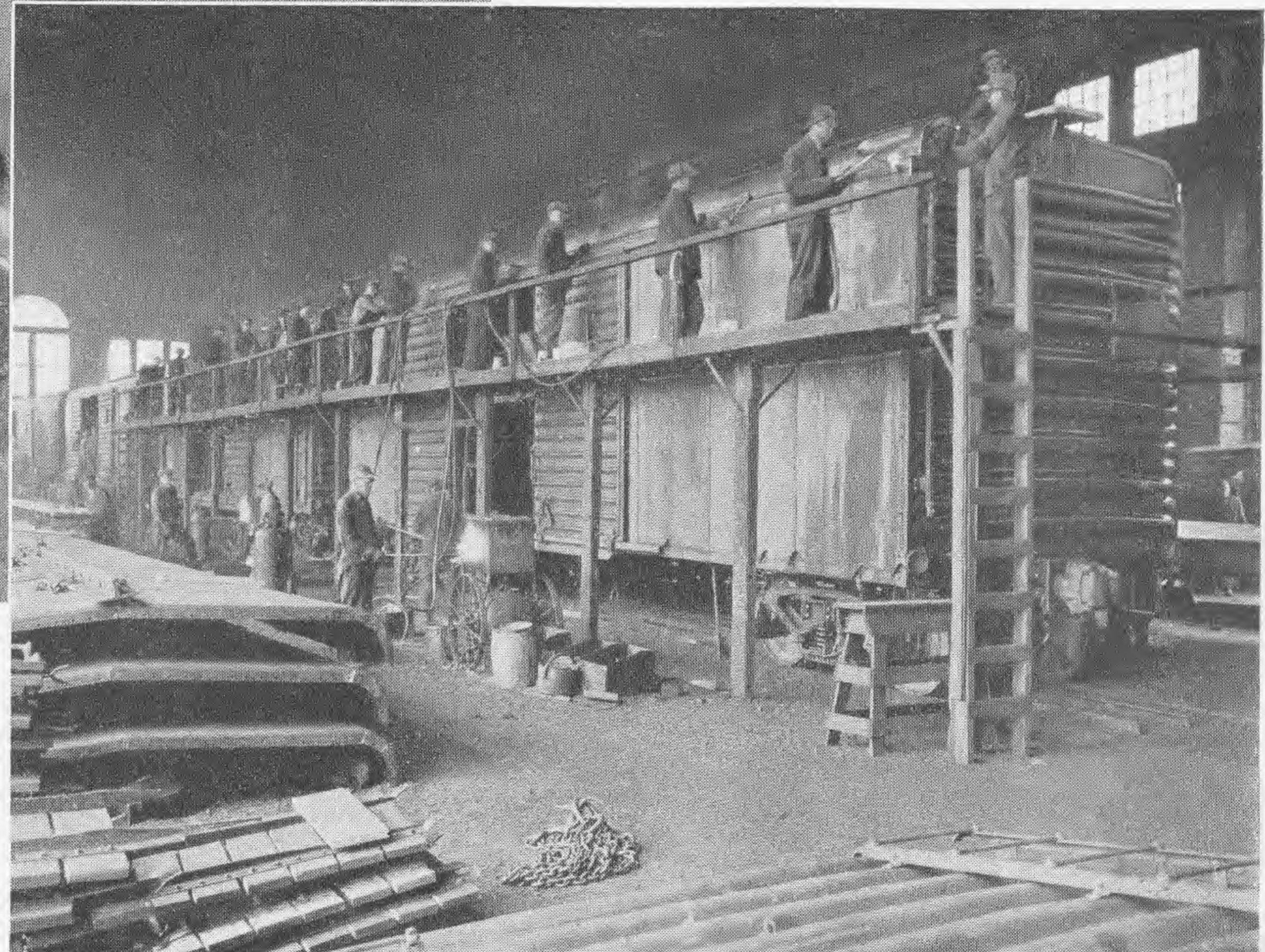
Weight . . . . . 45,000 Lbs.

# Pennsylvania Railroad Shops where Locomotives and Cars are Built and Repaired

*Left:* Railroad cars are built on an assembly line, much as automobiles. Here the steel under-frame is being fitted to the trucks.



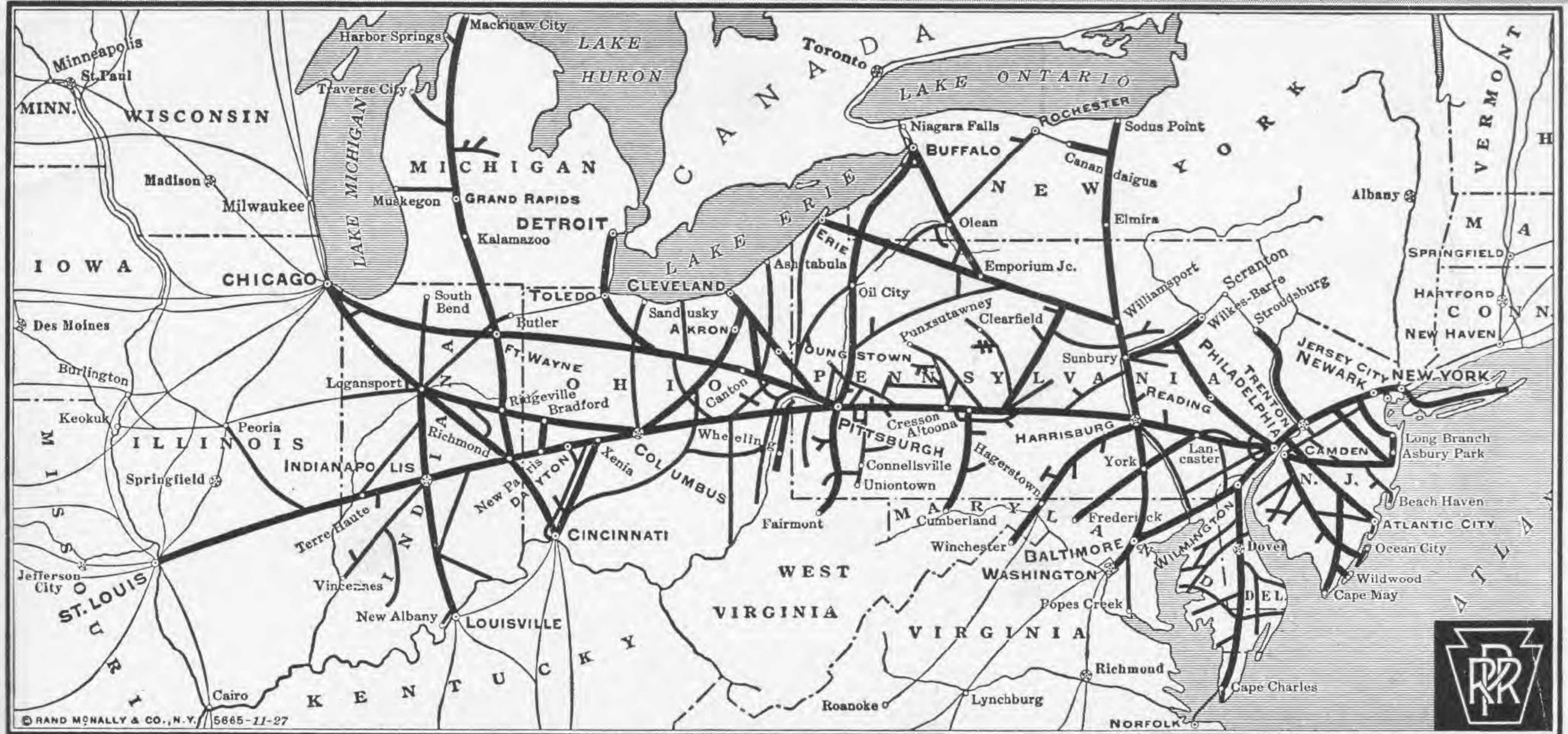
*Right:* In this picture, nearly completed box cars are receiving final touches to their roofs prior to being moved out on the yard tracks.



**Group of New GG-1 Streamlined Electric Locomotives Under Construction**



# Map of the Pennsylvania Railroad System



Connections from and to the West at Chicago and St. Louis. Through service and connecting services to and from New England and Eastern Canada at New York; to and from the South at Washington and Cincinnati.



4863

4863

4863

PENNSYLVANIA RAILROAD

**PENNSYLVANIA RAILROAD**