called the brake step, is also sometimes used. A bracket called a tank step is attached to the tanks of tank cars.

Step Box. A portable box-shaped step, for use between the bottom passenger car step and a low station platform.

Step Hanger. A vertical board or metal plate by which the steps are supported from the corner of a car and from the platform end sill.

Step Nosing. A metallic facing or molding for the tread of stair steps.

Step Riser. The vertical portion of a step in stairs.

Step Treads. See SAFETY TREAD and TREAD.

Steps, Folding. On many streamlined passenger cars the vestibule steps are hinged to fold up when closed, forming a smooth outline.

Stile. The upright pieces on the outer edge of a door or sash, as door stile, sash stile, window stile, etc.

Stirrup. A kind of ring or bent bar of iron resembling somewhat the stirrup of a saddle. A coupler carry iron is sometimes called a stirrup.

Stock Car. A car for the transportation of live stock, equipped with roof, slatted sides and side doors, single or double deck and frequently with feed and water troughs.

Stop Bar (Sleeping Car). A bar to connect the two seats on which the seat bottoms may rest when drawn down to make up a lower berth. It rests upon a stop bar plate.

Stop Bar Guide. An attachment to hold a stop bar in place laterally.

Stop Cock. A simple form of cock having a body and tapered plug which has an opening through it. When the plug is turned so that the holes in it correspond to the ports in the body the liquid flowing in the pipe can pass through the cock. When the plug is turned so that the openings do not correspond, the flow is stopped.

Stop-Key Journal Bearing. A key or wedge with a lug or projection which bears against the end of the axle to restrain lateral motion and thus dispense with a collar on the axle. Not in general use.

Storage Battery. A storage battery consists of a number of metallic plates, separated by suitable insulators, immersed in an electrolyte within a proper container. Its function is to convert electrical energy into chemical energy during the operation known as charging and the reverse when discharging. When charging, the terminals are properly connected to a source of electrical supply, usually a direct-current generator driven from the car axle or by an independent engine. Storage batteries are used to supply current for car lighting and air conditioning in passenger train cars and are carried in battery boxes suspended from the underframe.

Storage Battery Car. A motor car driven from storage batteries.

Stove Pipe Jack. A covering or bonnet for the aperture of a stove pipe on the outside of a car. Practically obsolete except on cabooses and work cars.

Strap Bolt or **Lug Bolt.** A round bolt with a flat bar of iron or steel welded to it, and usually with a hook on the end which serves the purpose of a head. The flat bar has holes in it, by which it can be fastened in place with rivets, bolts, or screws.

Strap Washer. An iron or steel strap which takes the heads of several bolts. Also called washer plate.

Streamline. The general term given to the type of construction which provides a smooth continuous outer surface on passenger cars. By rounding both ends of a train equipped with such cars, head-on air resistance and air drag are reduced.

Street Ell. An elbow pipe fitting with male thread on one end and female thread on other end.

Striker. See STRIKING PLATE.

Striker Arm. A seat arm. The terms striker arm, seat back arm and seat arm are commonly used.

Striking Horn. The stop shoulder, or horn of a coupler, arranged to touch the striking plate before the draft gear goes solid.

Striking Plate. A member placed on the ends of the center sills of freight cars against which the horn of the coupler strikes, preventing damage to the draft gear and center sills.

String Board (Passenger Car Steps). A vertical plate which supports the ends of the steps. A step hanger.

Stringer. A term sometimes applied to a floor nailing strip or a steel member which acts as a support for a nailing strip. A longitudinal floor stringer sometimes occupies a position similar to that of an intermediate sill but is not designed to perform its duties. See NAILING STRIP.

Stringer Pocket. A casting for supporting the end of a beam or stringer. In automobile and similar cars, for facilitating the use of a second or upper deck for increasing the loading capacity for small freight.

Strut (Truss). A member subjected to a strain of compression. A vertical strut is usually called a post. See also BRAKE BEAM STRUT.

Stud. A headless bolt, threaded on both ends. A standing bolt, pin, boss or protuberance designed to hold an attached object in place. Especially a headless bolt permanently screwed into a tapped hole in a casting or forging.

Sub-Carline (Refrigerator Car). A strip of wood under the main carline, supporting the sub-roof. See CARLINE.

Sub-Floor (Refrigerator Car). A layer of flooring boards under the main floor, and usually separated from it by an air space and hair felt or some other form of special insulation.

Sub-Roof (Refrigerator Car). The inside layer of boards of the roof proper, supported on sub-carlines.

Sub-Sill. A sill attached under another sill to reinforce it.

Subway Car. An electric motor car for use in subways in large cities.

Sugar Cane Car. See CANE CAR.

Supply Pipe (Air Compresser). A pipe sometimes connected to the air inlet of an air compressor by means of which the air supply is drawn from a point some distance away from the compressor.

(Lavatory Fittings.) Pipes which carry hot or cold water to the basin faucets.

Supply Valve (Steam Heating). A valve for regulating the supply of steam in the radiator pipes of a car.

Suspension (Motor Car). The method of supporting a railway motor. Except in the case of gearless motors, the suspension is designed to put as little dead weight as possible on the axle.

(Electric Lighting.) The iron work and fittings which are attached to the body or truck for supporting or suspending the axle generator and which include the belt tightening and aligning devices. The

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Trap Door Latch (Vestibule). The latch for the vestibule trap door.

Trap Door Lock. See TRAP DOOR LATCH.

Traversing Jack. A jack that can be moved horizontally on a bed or track while under its load. See JACK.

Tread (of a Step). The part on which the foot is placed. See TREAD BOARD and SAFETY TREAD.

(Of a Car Wheel.) The exterior cylindrical surface of a car wheel next to the flange which comes in contact with the rail.

Tread Board (of a Step). The horizontal part on which the foot is placed. Usually covered with rubber or metal safety treads to prevent slipping. See TREAD and SAFETY TREAD.

Triple Valve (Air Brake). A device which automatically performs three functions in operating the air brakes on older freight cars. It charges the auxiliary reservoir, applies the brakes and releases the brakes according to the varying pressures in the train line. Now being superseded by AB equipment.

Triple Valve Branch Pipe (Air Brake). A short pipe by which the triple valve is connected with the brake pipe.

Triple Valve Gasket. A gasket placed in the joint between the triple valve and the passenger brake cylinder or freight car auxiliary reservoir.

Triple Valve Piston (Air Brake). See TRIPLE VALVE.

Trolley. See PANTAGRAPH TROLLEY.

Truck. The general term covering the assembly of parts comprising the structures which support a car body at each end (or, in the case of articulated cars, the joint support of two abutting car ends) and also provide for attachment of wheels and axles.

Truck Bolster. A cross member in the center of a truck, on which the car body rests. The truck bolster is connected to the body bolster by a center pin, which passes through both.

Truck Bolster Guide. A small projection at the ends of a truck bolster that engages the vertical member of the truck frame preventing spreading of the latter.

Truck Bolster Guide Bar. See BOLSTER GUIDE BAR.

Truck Car. A car used in a wreck train for carrying spare trucks. See WRECK TRAIN EQUIPMENT.

Truck Center Plate. See CENTER PLATE.

Truck Frame. A structure made of cast steel in one piece, to which the journal boxes or pedestals, springs and other parts are attached, and which forms the skeleton of a truck. See TRUCK SIDE FRAME.

Truck Lever. That part of the foundation brake rigging which applies the power of the brake cylinder at the brake beams. On freight car trucks there is a live lever and a dead lever collectively known as truck levers. On passenger cars truck levers assume various positions according to the type of brake rigging used.

Truck Lever Connection. A rod or bar connecting the brake levers on the truck brake gear.

Truck Side Bearing. A device attached to the top of the truck bolster and having an upper bearing surface which comes in contact with a similar bearing surface fastened to the underside of the body bolster. See SIDE BEARING.

Truck Side Frame. The longitudinal portion of a truck structure, on the outside of the wheels, which extends from one axle to the other, and to which the journal boxes and bolsters or transoms are attached or form a part.

Truck Springs. The springs that carry the weight of the car body and its load to the running gear or trucks. On freight cars the truck springs are generally of the helical type placed in groups between the bolster and bottom chord of the truck frame. Helical springs are used on passenger car trucks both as equalizer springs and sometimes at the bolster. On some cars helical springs are placed directly over the journal box, the truck frame resting upon them. Elliptical springs are made in groups for use on passenger car bolsters and occasionally semi-elliptic springs are employed in different types of trucks. See SPRING, ELLIPTIC, HELICAL AND VOLUTE.

Trunnion. A cylindrical projection on the side of any part that allows a turning or oscillating movement.

Truss. An engineering term applied to certain types of built-up load-carrying structures so designed that the individual members comprising together the complete unit are subject only to compression or tension loads.

Truss Rod. A rod or set of rods usually placed beneath the sills of wooden cars to carry the tension stress of a truss.

Tufting Button. A button used in upholstery to hold the cord which passes through the upper covering of the upholstered surface, dividing it into squares or diamonds.

Tumbler (Lock). A latch engaging with a notch in a lock bolt, or otherwise opposing its motion until it is lifted or arranged by the key so as to remove the obstacle.

Tup. See HAMMER.

Turbo-Generator. A steam turbine direct-connected to a generator for furnishing electric current. The turbo-generator receives steam from the locomotive.

Turnbuckle. An elongated sleeve with a right and left hand thread at either end for the purpose of tightening two rods together.

Turn Over Seat. See REVERSIBLE CAR SEAT.

Turtle Back Roof. See ARCHED ROOF.

Twin Car Seat. A seat stand with a division arm, two cushions and two seat backs with two striker arms each, so that they may be turned to bring the occupants face to face. See RECLINING CHAIR.

U

U-Bolt. A double bolt made of a bar of steel or iron bent to the shape of the letter U, with a screw thread on each end.

U-Bolt Casting. A casting so shaped that a U-bolt can fit around it to form a bearing or carrier for a pin or bolt.

U C Brake Equipment. A standard brake equipment for general passenger train service. The principal units include a Universal Valve used with three reservoirs, Auxiliary, Service, and Emergency, also one brake cylinder for both service and emergency applications, except in the cases of very heavy cars which require the use of two cylinders.

Uncoupling Lever or **Uncoupling Rod.** A rod with a bent handle forming a lever, usually attached to the end sill, by which the lock of the automatic coupler is opened and the cars uncoupled without going between them. The lever proper is the part attached to the rod and operating the unlocking mechanism, but in the case of freight cars the lever and rod are generally made in one piece. The short lever which is directly connected to a passenger

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Vestibule Lamp. A lamp used for lighting a car vestibule.

Volt. The basic unit of electric potential, pressure, or electro-motive force. The International Volt is the potential difference required to maintain a steady current of one ampere in a circuit whose resistance is one ohm.

Voltmeter. An instrument for measuring the voltage of electric currents.

Volute Spring. A spring made of flat metal wound in a spiral scroll. Used for in certain types of friction bolster springs and for buffer springs on foreign cars.

W

Wagon. British for Freight Car.

Wainscoting. The lining for interior walls of a passenger car body. Term applies especially when paneling and relatively elaborate workmanship are employed.

Wainscot Panel (Passenger Car Interior). A panel under the windows between the two wainscot rails.

Wainscot Rails (Passenger Car Interior). Longitudinal strips extending from one end of the car to the other, used in connection with wainscoting. The wainscot end rails are the wainscot rails at the end of the car.

Walkover Seat. A term used to designate a type of car seats in which the back does not turn over when the seat is reversed. Also called GLIDEOVER, PUSHOVER and SLIDEOVER.

Wall Lamp. A lamp to fit in a recess in the wall of a car or corridor.

Wall Seat End. The seat end next to the wall or side of a car, so called in distinction from the aisle seat end.

Wardrobe (Postal Car). See POSTAL CARS.

Wards (Lock). The interior circular ridges which fit into corresponding recesses in the bit of a key (the latter also termed wards), the surrounding solid parts of the bit being called the web.

Washer. A plate of metal or other material, usually annular, which is placed under a nut or bolt head to give it a better bearing. Washers in car work generally take their name from that of the bolt or rod to which they are attached.

Washer Plate. See STRAP WASHER.

Washstand. A basin or lavatory installed as a permanent fixture for cleaning purposes. Equipped with water supply and outlet. On some types of cars the washstands are made to fold up out of the way when not in use.

Waste. Threads of wool or cotton or mixtures of these into which is incorporated mechanically curled vegetable fiber, often cocoanut fiber, to impart to the product an elasticity not possessed by wool or cotton threads. The material is saturated with lubricating oil and placed in a journal box so that it comes in contact with the lower half of the journal. Sometimes called packing or dope. Various special compositions have been developed, sometimes with springs inserted in the mass to impart greater resiliency. Manual, A-905.

Waste Cock. A cock for drawing off water from a tank or basin. (Baker Heaters.) A cock attached to the expansion drum or circulating drum of the Baker heater for drawing off or changing the water in the heater pipes.

Wastometer. A device for flushing water closets.

Water Alcove. A recess in the side of a partition of a passenger car to receive the faucet of a water cooler or water pipe and a drinking cup.

Water Circulation Heating System. See HOT WATER CIRCULATION HEATING SYSTEM.

Water Cooler. A tank or vessel for carrying drinking water, which is cooled by electric refrigeration or with ice. The sides are generally made double, and the space between filled with some non-conducting substance. See WATER ALCOVE, WATER TANK.

Water Drip. A pan or receptacle to receive the waste water from a water cooler. A drip pipe, or waste pipe, is connected to it.

A slight projection or raised seam in the roof of a passenger or baggage car over the side doors, or at the end of the car in the platform roof to divert the water so it will not fall upon persons entering the car or passing from one car to the next

Water Gage. See GLASS WATER GAGE.

Water Mixing Valve. A device for mixing hot and cold water in a lavatory.

Water Seal. See TRAP.

Water Supply. The system of water supply used in coaches and Pullman cars is under air pressure. The system provides for forcing water into the wash bowls by air pressure taken from the air brake system. Hot water is usually heated by using live steam from the locomotive.

Water Tank. A vessel or reservoir for holding water. Those used on cars for drinking water are usually made of sheet iron, and often extend to the roof. They are then usually drawn from by a water alcove, the tank usually being in the corner and concealed from the interior of the car. Water used in dining car kitchens is usually carried in overhead tanks.

For size and arrangement of water tank in postal cars, see POSTAL CARS.

Watt. The unit commonly used in measuring electric power. The International Watt represents the power expended by an electric current of one International Ampere flowing through a resistance of one International Ohm. In d. c. electrical calculations the product of voltage multiplied by amperage equals the number of watts. One watt equals $1/746$th of one horsepower or conversely, one horsepower equals 746 watts. Also see AMPERE, OHM, OHM'S LAW, and VOLT.

Wattmeter. An instrument for measuring electric power directly in watts. See WATT.

Waved Moldings. Moldings which by a special machine are made of a corrugated section longitudinally.

Way Car. See CABOOSE.

Wear Plate. A plate placed between two moving surfaces to withstand frictional wear.

Weather Strips. A strip for application around the crevices of windows or doors, for excluding the dust and wind, and for preventing water from entering around the windows.

Web. A term applied to the center portion of a beam, as an I-beam, which ties the flanges together.

Web Filler. See BODY BOLSTER FILLER.

Webbing. A strong fabric, made of hemp or other material which is not likely to stretch, used in upholstering car seats.

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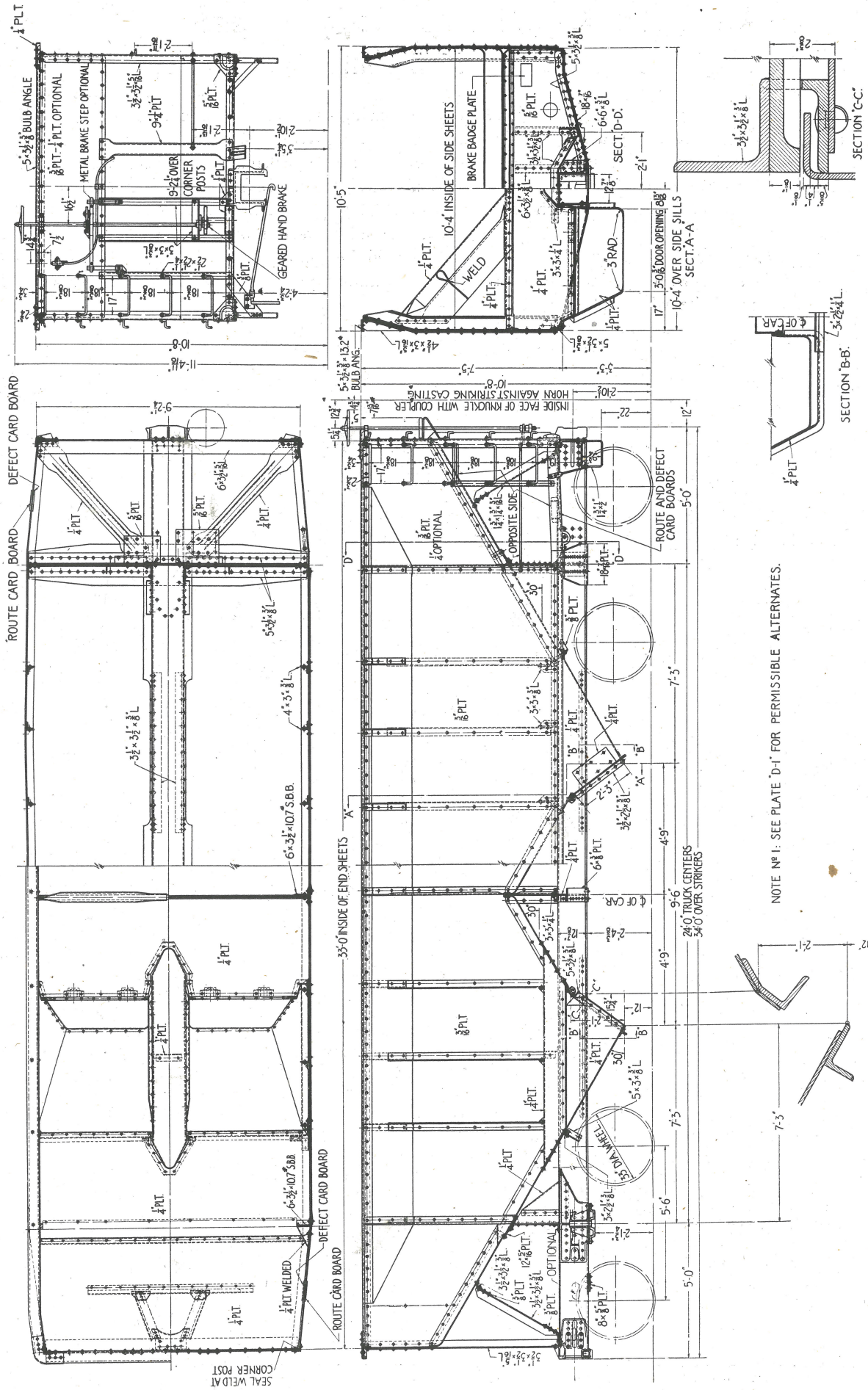


Fig. 2.601—Plan and elevation of A. A. R. Standard 50-ton hopper car (2 hoppers). Class HM.
(For A. A. R. 70-ton hopper cars see Pages 274 and 279)
(See A. A. R. Supplement to the Manual, Plate 600-C)

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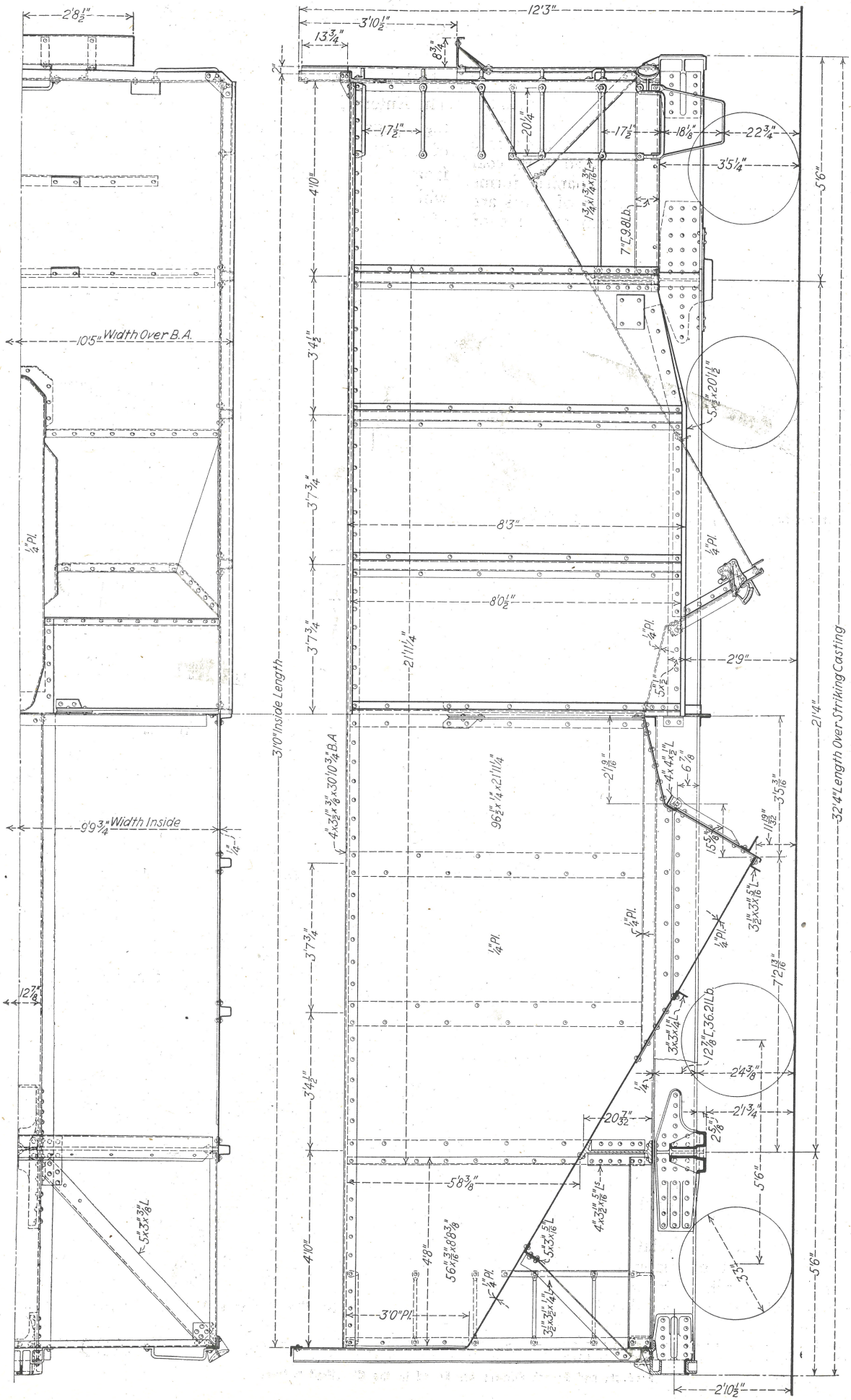


Fig. 2.604—Norfolk & Western 55-ton hopper car (2 hoppers), Road Class, HL, A. A. R. Class HM. Design characterized by the small number of parts.
(Note: Some changes, including 3/8 in. end and slope sheets have been made in last cars built)
(*See also Page* 259)

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Fig. 2.605—Norfolk & Western 55-ton hopper car, Road Class HL, A. A. R. Class HM. Road Numbers 22,000-25,999; 38,000-39,999; 56,500-59,999; 67,000-69,999

(See also Figs. 2.604-2.607)

Dimensions and Weights—N. & W. Class HL Hopper Car

Length over striking plates	32 ft. 4 in.
Coupled length	34 ft. 10 in.
Truck centers	21 ft. 4 in.
Truck wheel base	5 ft. 6 in.
Axle journals	5½ in. x 10 in.
Inside length	31 ft. 0 in.
Inside width	9 ft. 9¾ in.
Cubical capacity, level full	1,998 cu. ft.
Cubical cap., with 30 deg. heap	2,429 cu. ft.
Weight of empty car (average)	41,200 lb.
Load limit (average)	127,800 lb.
Weight of one truck	7,200 lb.
Height from rail to top car side	11 ft. 0 in.

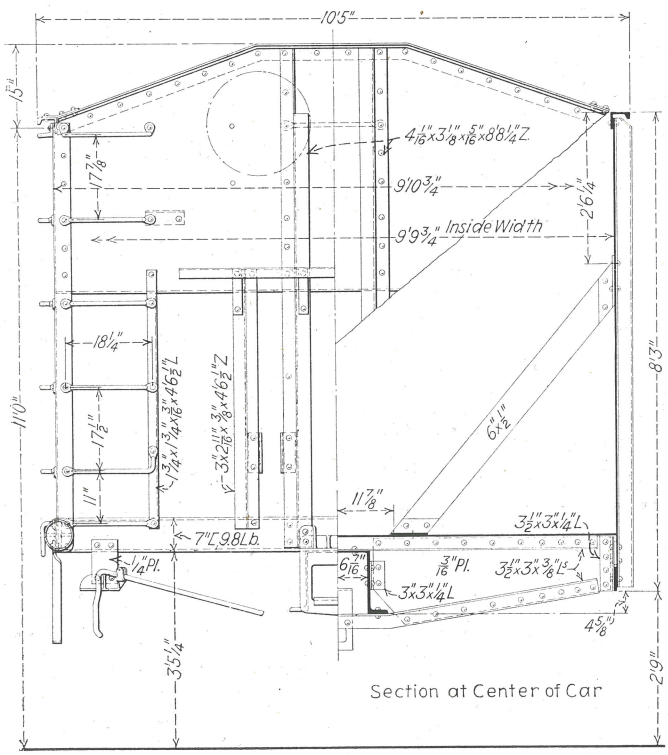


Fig. 2.606—End view and cross section of Norfolk & Western Class HL hopper car shown on Page 258.

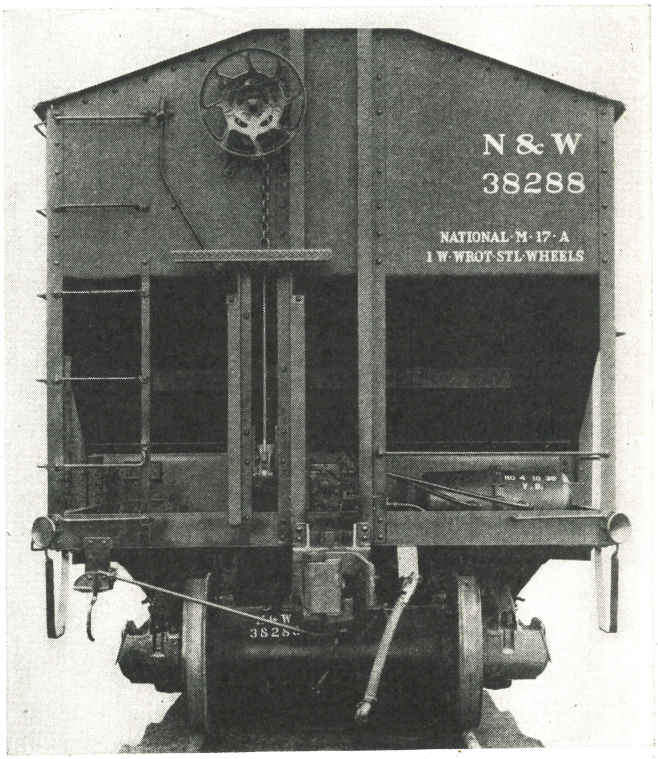


Fig. 2.607—Norfolk & Western 55-ton hopper car, Road Class HL.

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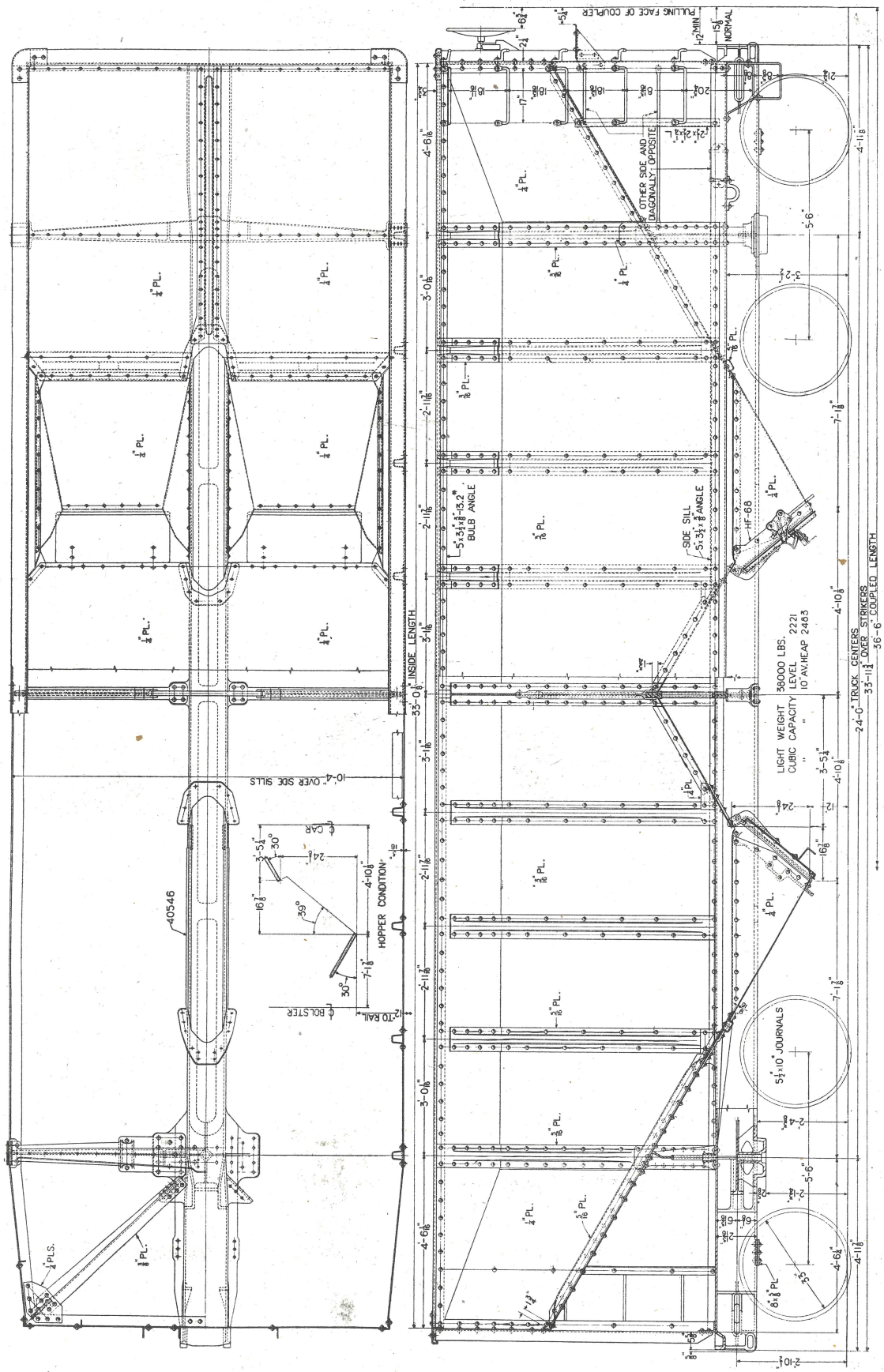


Fig. 2.608—Plan and elevation of Unitcast design, high-capacity, 60-ton twin hopper car with cast steel center sill, body bolsters, crossbearer arms and hopper frames

Unitcast Corporation.

(*See also Pages 261, 262, 263*)

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