

APPENDIX C. GLOSSARY

A

Acid Bessemer.—Steel made by the bessemer process in a furnace having an acid lining, usually ganister or other highly siliceous material. Phosphorus and sulfur are not removed in the refining process.

Acid Open-Hearth.—Steel made by the open-hearth process in a furnace lined with acid or siliceous material. Because of the character of the furnace, an acid slag must be employed for refining the bath in this process. Since phosphorus and sulfur are not removed by an acid steel making process, the metallic charge must be made up of specially selected pig iron and scrap.

Adzing Machine.—Portable power-operated machine designed to adz the rail seat on ties to provide proper bearing for rail or tie plates.

Alignment.—The horizontal location of a railroad as described by curves and tangents.

Antisplitting Iron.—A piece of steel strip, bevelled on both sides at one edge, and bent to a desired shape, for application by driving into the end (cross section) of a tie or timber to control its splitting.

Asphalt Cement.—A fluxed or unfluxed asphaltic material, especially prepared as to quality and consistency, suitable for direct use in the manufacture of asphaltic pavements, and having a penetration of between 5 and 250.

B

Ballast.—Selected material placed on the roadbed for the purpose of holding the track in line and surface.

Ballast Curb.—A longitudinal timber placed along the outer edge of the floor on ballast deck bridges to retain the ballast.

Batter.—The deformation of the surface of the head of the rail in the immediate vicinity of the end.

Batter.—A deviation from the vertical in upright members of a trestle bent.

Batter Pile.—One driven at an inclination to resist forces which are not vertical.

Bent.—The group of members forming a single vertical support of a trestle, designated as pile bent where the principal members are piles, and as framed bent where of framed timbers.

Berm.—(a) The space left between the top or toe of slope and excavation made for intercepting ditches or borrow pits; (b) An approximately horizontal space introduced in a slope.

Bond.—In stone or brick masonry, the mechanical disposition of stone, brick, or other building blocks by overlapping to break joints. (See English Bond; Flemish Bond.)

Borrow (noun).—All material used in making embankments, which does not come from necessary excavation.

Borrow Pit.—An excavation made for the purpose of obtaining embankment material.

Branch Line.—The secondary line or lines of a railway.

Branding.—The identification markings hot rolled in raised figures and letters in the rail web indicating the weight of rail and section number, type of rail, kind of steel, name of manufacturer and mill, and year and month rolled.

Bridge Tie.—A transverse timber resting on the stringers and supporting the rails.

Broken Base.—Any break in the base of a rail.

Brush.—Trees less than 4-inch stump-top

diameter, shrubs or branches of trees that have been cut off.

Bulkhead.—A structure to prevent sliding of natural ground or fill material into the water; the limiting wall or structure along a waterfront.

Bulkhead.—Timbers placed against the embankment side of an end trestle bent to retain the embankment.

Burrs.—The rough edges left at the end of a rail when sawed; or on the side of the web when drilling bolt holes.

C

Camber.—Slight convexity built into a span to counteract sag resulting from elastic deflections.

Cant.—The inward inclination of a rail, effected by the use of inclined-surface tie plates, usually expressed as a rate of inclination, such as 1 in 40, etc.

Cap.—A horizontal member on the top of piles or posts, connecting them to form a bent.

Cap-Stringer Strap.—A piece of round, square, or structural shape iron or steel, either straight or bent, used to fasten stringers to a cap by means of horizontal bolts without the use of drift bolts.

Car Retarder.—A braking device, usually power-operated, built into a railway track to reduce the speed of cars by means of brakeshoes which, when set in braking position, press against the sides of the lower portions of the wheels.

Cast Iron.—Alloys of iron containing 1.7 to 4.5 percent carbon as cast, and usually not appreciably malleable at any temperature.

Cinders.—The fused residue from coal burned in locomotives and other furnaces.

Closure Rails.—The rails between the parts of any special trackwork layout, as the rails between the switch and the frog in a turnout (sometimes called the Lead Rails or

Connecting Rails); also the rails connecting the frogs of a crossing or of adjacent crossings, but not forming parts thereof.

Compound Fissure.—A progressive fracture originating in a horizontal split head which turns up or down in the head of the rail as a smooth, bright or dark surface, progressing until substantially at a right angle to the length of the rail. Compound fissures require examination of both faces of the fracture to locate the horizontal split head from which they originate.

Compressive Strength.—The maximum compressive stress which a material is capable of sustaining.

Compromise Joint (Bar).—Joint bars designed to connect rails of different fishing height and section, or rails of the same section but of different joint drillings.

Compromise Joint (Rail).—A joint for uniting the abutting ends of contiguous rails of different sections, or of rails of the same section but of different joint drillings.

Continuous Welded Rail.—A number of rails welded together in lengths of 400 feet or longer (CWR). (See also **Welded Rail**.)

Contract.—A written agreement between two or more parties specifying terms, conditions, etc., under which certain obligations must be performed. (Specifications are a part of the contract.)

Conventional Sign.—A symbol, such as a mark, character, abbreviation, or letter, selected or sanctioned by general agreement or common use to indicate upon map or plan certain forms, conditions, or objects, both natural and structural.

Corrosion.—The dissolving or eating away of the surface of metal through chemical action, either regularly and slowly as by rusting in air, or irregularly and rapidly as by pitting and grooving in the interior of boilers.

Corrugated Rail.—A rough condition on the

rail tread of alternate ridges and grooves, which develops in service.

Coupler.—The device by means of which any car or machine to be towed is connected to the towing agency. Coupler includes draw head, and coupler links and pins, or other device for connecting two draw heads.

Coupler Drawbar.—The portion of a coupler used to connect the draw heads of two cars or other units of roadway machinery.

Coupler Drawhead.—That portion of a coupler that is rigidly attached to motor car, trailer, or unit of roadway machinery designed to be towed.

Creosote.—As used in wood preserving, creosote is a distillate of coal tar produced by high-temperature carbonization of bituminous coal; it consists principally of liquid and solid aromatic hydrocarbons, and contains appreciable quantities of tar acids and tar bases; it is heavier than water; and has a continuous boiling range of at least 125° C beginning at about 200° C.

Crop End.—A piece cut from the end of a bloom or rail during manufacture.

Crossing (Track).—A structure, used where one track crosses another at grade, and consisting of four connected frogs.

Bolted Rail.—A crossing in which all the running surfaces are of rolled rail, the parts being held together with bolts.

Manganese Steel Insert.—A crossing in which a manganese steel casting is inserted at each of the four intersections, being fitted into rolled rails and forming the points and wings of the crossing frogs.

Solid Manganese Steel.—A crossing in which the frogs are of the solid manganese steel type.

Movable Point.—A crossing of small angle in which each of the two center frogs consists essentially of a knuckle rail and two opposed movable center points with the necessary fixtures.

Single-Rail.—A crossing in which the connections between the end frogs and the center frogs consist of running rails only.

Two-Rail.—A crossing in which the connections between the end frogs and the center frogs consist of running rails and guard rails.

Three-Rail.—A crossing in which the connections between the end frogs and the center frogs consist of running rails, guard rails, and easer rails.

Crossing Plates.—Plates interposed between a crossing and the ties or other timbers to protect the ties and to better support the crossing by distributing the loads over larger areas. (For names and descriptions of various styles, see Plan Basic. No. 700-D in the Portfolio of Trackwork Plans.)

Center Frogs.—The two frogs at the opposite ends of the short diagonal of a crossing.

End Frogs.—The two frogs at the opposite ends of the long diagonal of a crossing.

Knuckle Rail.—A bent rail, or equivalent structure, forming the obtuse point against which the movable center points, of a movable point crossing or slip switch, rest when set for traffic.

Movable Center Point.—One of the movable tapered rails of a movable point crossing or slip switch.

Running Rail.—The rail or surface on which the tread of the wheel bears.

Crossover.—Two turnouts with the track between the frogs arranged to form a continuous passage between two nearby and generally parallel tracks.

Double.—Two crossovers which intersect between the connected tracks.

Cross Section.—A vertical section of the ground at right angles to the centerline.

Crushed Head.—A “flattening” or crushing down of the head of a rail.

Curve-Compound.—A continuous change in

direction of alignment by means of two or more contiguous simple curves of different degrees having a common tangent at their junction points.

Degree of.—The angle subtended at the center of a simple curve by a 100-foot chord.

Easement.—A curve whose degree varies either uniformly or in some definitely determined manner so as to give a gradual transition between a tangent and a simple curve, which it connects, or between two simple curves.

Reverse.—Two contiguous simple curves in opposite directions, with a common tangent at their junction point.

Simple.—A continuous change in direction of alignment by means of an arc of a single radius.

Vertical.—An easement curve in the track to connect intersecting grade lines.

Curved Lead.—The distance between the actual point of switch and the half-inch point of the frog measured on the outside gage line of the turnout.

D

Damaged Rail.—Any rail broken or injured by wrecks, broken, flat or unbalanced wheels, slipping or similar causes.

Dating Nail.—A nail with a head having a raised or depressed number or symbol which is driven into a longitudinal surface of a pile, pole, tie, or timber to identify the year in which the material was treated.

Decay.—Disintegration of the wood substance due to the action of wood destroying fungi.

Depth (Ballast).—The distance from the bottom of the tie to the top of the subgrade.

Derail.—A track structure for derailing rolling stock in case of an emergency. (See also Switch Point Derail.)

Detail Fracture.—A progressive fracture

originating at or near the surface of the rail head. These fractures should not be confused with transverse fissures, compound fissures, or other defects which have internal origins. Detail fractures usually have their origins in the following types of defects, and progress crosswise into the head of the rail.

Shell.—Where a thin shell of metal becomes separated from the head, usually at the gage corner.

Head Checks.—Usually at or close to the gage corner where movement or flow of surface metal is sufficient to start a hairline crack.

Diesel (see Engine).

Dock.—(a) A natural or artificial inlet or basin used by boats, including both the water and the protecting sides. (b) A structure against which boats land to discharge cargoes and passengers. Synonymous with wharf and used very generally on the Great Lakes.

Drift Bolt.—A piece of round or square metal, with or without head or point and of specified length, driven as a spike.

E

Electrolysis.—The process whereby an electric current passing from an electrode to an electrolyte or vice-versa, causes chemical changes to take place in the electrolyte. Electrolysis is also the process of decomposition which is aided by the passage of an electric current.

Elevation (of Curves) (Superelevation).—The vertical distance that the outer rail is above the inner rail.

Embankment (or Fill).—A bank of earth, rock, or other material constructed above the natural ground surface.

End Chipping.—The loosening of the metal on the top or gage side of the end of a rail.

End Hardening.—Heat treatment of the top portion of the heads of rails at the ends to minimize rail batter.

End Overflow.—A projection of metal into the joint gap at the top or side of the head of a rail.

Engine Burn Fracture.—A progressive fracture originating in spots where driving wheels have slipped on top of the rail head. In developing downward they frequently resemble the compound or even transverse fissure with which they should not be confused or classified.

Equipment.—Motive power and other rolling stock, floating equipment, and highway vehicles used in transportation service.

F

Facility.—Property physically distinct and capable of rendering a specific service.

Fastenings.—Joint bars, bolts, and spikes.

Auxiliary.—Nutlocks, spring washers, tie plates, rail braces, and anticreeping devices.

Fishing Space.—The space between the head and base of a rail occupied by the joint bar.

Fish-Plate.—A short piece lapping a joint, secured to the side of two members, to connect them end to end.

Flare.—A tapered widening of the flangeway at the end of the guard line of a track structure, as at the end of a guard rail or at the end of a frog or crossing wing rail.

Opening.—The distance between the gage line and the guard line of a track structure at the wider end of the flair.

Flangeway.—The open way through a track structure which provides a passageway for wheel flanges.

Depth.—The depth of the wheel flange passageway, or the vertical distance from the top of the tread surface to the top of the filter or separator introduced between the tread portion and the guard portion of a track structure.

Width.—The distance between the gage line

and the guard line of a track structure, which provides a passageway for wheel flanges.

Flowed Head.—A rolling out of the metal on top of the head of a rail toward the sides without showing any indication of a breaking down of the head structure.

Footing.—A structural unit used to distribute wall or column loads to the foundation materials.

Foundation.—Material, including piling or other special construction, which supports the structure and its loads.

Framed Trestle.—A structure in which the upright members or supports are framed timbers.

Frog.—A track structure used at the intersection of two running rails to provide support for wheels and passageways for their flanges, thus permitting wheels on either rail to cross the other.

Bolted Rigid.—A frog built essentially of rolled rails, with fillers between the rails, and held together with bolts. (For names of detail parts, see Plan Basic No. 390 in the Portfolio of Trackwork Plans.)

Spring-Rail.—A frog having a movable wing rail which is normally held against the point rail by springs, thus making an unbroken running surface for wheels using one track, whereas the flanges of wheels on the other track force the movable wing rail away from the point rail to provide a passageway.

Spring-Rail, Right Hand and Left Hand.—Standing at the toe end of a spring-rail frog and looking toward its point, a right-hand frog has the movable wing rail located on the right-hand side, and a left-hand frog has the movable wing rail located on the left-hand side.

Railbound Manganese Steel.—A frog consisting essentially of a manganese steel body casting fitted into and between rolled rails and held together with bolts.

Solid Manganese Steel.—A frog consisting essentially of a single manganese steel casting.

Self-Guarded (Flange Frog).—A frog provided with guides or flanges, above its running surface, which contact the tread rims of wheels for the purpose of safely guiding their flanges past the point of the frog.

Clamp.—A frog built essentially of rolled rails, with fillers between the rails, and held together with clamps.

Angle.—The angle formed by the intersecting gage lines of a frog.

Number.—One-half the cotangent of one-half the frog angle, or the number of units of centerline length in which the spread is one unit.

Point.—That part of a frog lying between the gage lines extending from their intersection toward the heel end.

Theoretical.—The point of intersection of the gage lines of a frog.

Half-inch.—A point located at a distance from the theoretical point toward the heel equal in inches to one-half the frog number, and at which the spread between the gage lines is 1/2 inch. It is the origin from which measurements are usually made.

Guard.—The point formed by guards introduced or extended into the toe portion of a frog.

Heel End of.—That end of a frog which is the farther from the switch; or, the end which has both point rails or other running surfaces between the gage lines.

Heel Length.—The distance between the heel end and the half-inch point of a frog, measured along the gage line.

Heel Spread.—The distance between the gage lines at the heel end of the frog.

Throat of.—The point at which the converging wings of a frog are closest together.

Toe End of.—That end of a frog which is nearer the switch; or, the end which has both gage lines between the wing rails or other running surfaces.

Toe Length.—The distance between the toe end and the half-inch point of a frog, measured along the gage line.

Toe Spread.—The distance between the gage lines at the toe end of the frog.

Wing Wheel Risers.—Raised portions provided on the top surfaces of the wings of a frog, more particularly when of manganese steel design, directly opposite the point and gradually sloping down to the general level of the running surface, thereby providing additional metal at those parts of the frog which usually wear out first, and also making the transverse contour conform more closely to that of the tread of a tapered wheel.

G

Gage (Track Tool).—A device by which the gage of a track is established or measured.

Gage (of Track).—The distance between the gage lines, measured at right angles thereto. (Standard gage is 4 feet 8-1/2 inches.)

Gage Line.—A line 5/8 inch below the top of the centerline of head of running rail or corresponding location of tread portion of other track structures along that side which is nearer the center of the track.

Gagging.—The work done on a rail at the straightening press with a steel “gag” or tool for the purpose of taking out a bend.

Grade (noun).—The ratio of rise, or fall, of the grade line to its length. (NOTE.—The term “Grade” is sometimes used to designate the finished roadbed, but such use conflicts with the meaning of “Grade” as given above and it should not be so used.)

Grade (verb).—To prepare the ground for the reception of the ballast and track.

Grade Line.—The line on the profile representing the tops of embankments and the bottoms of cuttings ready to receive the ballast; and is the intersection of the plane of the roadbed with a vertical plane through the centerline.

Gradient.—The rate of inclination of the grade line from the horizontal.

Grooved.—A cross tie which has had machine-gouged depressions across its top into which ribs on the bottom of a tie plate may fit.

Grout (noun).—A fluid mixture of cement and water or of cement, sand, and water, with or without admixture.

Guard Line.—A line along that side of the flangeway which is nearer the center of the track and at the same elevation as the gage line.

Guard Check Gage.—The distance between guard line and gage line, measured across the track at right angles to the gage lines.

Guard Face Gage.—The distance between guard lines, measured across the track at right angles to the gage lines.

Guard Rail.—A rail or other structure laid parallel with the running rails of a track to prevent wheels from being derailed; or to hold wheels in correct alignment to prevent their flanges from striking the points of turnout or crossing frogs or the points of switches.

A rail or other structure laid parallel with the running rails of a track to keep derailed wheels adjacent to running rails.

Frog.—A rail or other device to guide the wheel flange so that it is kept clear of the point of the frog.

Switch.—A rail or other track structure laid parallel with the running rail ahead of a split switch and forming a flangeway with the running rail, to hold the wheels of

rolling stock in correct alignment when approaching the switch.

One-Piece.—A guard rail consisting of a single complete unit, either fabricated or cast, so designed that no auxiliary parts or fastenings other than spikes are required for its installation.

Adjustable Separator.—A metal block of two or more parts acting as a filler between the running rail and the guard rail and so designed as to provide varying widths of flangeways.

Brace.—A metal shape designed to fit the contour of the side of the guard rail and extend over the tie, with provision for fastening thereto, to restrain the moving or tilting of the guard rail away from the running rail.

Brace, Adjustable.—A guard rail brace which may be adjusted laterally with respect to the rail, to vary the distance between the guard rail and the running rail.

Clamp.—A device consisting of a yoke and fastenings designed to engage the running rail and the guard rail and hold them in correct relation to each other.

Guard Timber.—A longitudinal timber placed outside of the track rail, to maintain the spacing of ties.

H

Hammer Blow.—A periodic vertical force due to the centrifugal force of the unbalanced parts on the revolving drivers of a locomotive.

Harbor Line (Inner and Outer).—(a) The lines defining the limits of a port or haven with regard to inner or best protected area and outer or less protected area. Often referred to in port regulations. (b) In certain locations of the country inner harbor line is synonymous with bulkhead line and outer harbor line with pier head line.

Hardness.—That physical property which enables a material to resist indentation or abrasion.

Hardwood.—One of the group of trees which has broad leaves. The term has no reference to the hardness of the wood.

Haul.—The distance grading material is moved in the construction of the roadway.

Heartwood.—Inner core of the tree trunk comprising the annual rings containing nonliving elements; usually darker in color than sapwood.

Heat or Melt.—The steel resulting from one charge of the melting furnace.

Helper Stringer.—A stringer added to an existing panel of stringers.

Horizontal Split Head.—A horizontal progressive defect originating inside of the rail head, usually 1/2 inch or more below the running surface and progressing horizontally in all directions, and generally accompanied by a flat spot on the running surface. The defect appears as a crack lengthwise of the rail when it reaches the side of the rail head. (See Compound Fissures.)

Hotbed.—A series of skids on which rails are placed for cooling after rolling, sawing, and cambering.

Hydraulic Grade Line.—A line joining the points to which water flowing through a pipe line under pressure will rise at various points at atmospheric pressure.

I

Imperviousness.—The quality of being completely resistant to penetration by water or other liquid.

Incline.—An inclined track or tracks and their supporting structure leading to the adjustable apron or bridge at a transfer slip.

Ingot.—A special form of casting poured direct from the teeming ladle for subsequent rolling or forging.

Bled.—An ingot which has fallen over while solidifying, or has met with some other mishap, allowing the liquid interior to escape but leaving the walls intact. It may bleed at the top or at the bottom, but usually at the top.

Butt.—A short ingot, usually the last one poured from a heat, for which there is not sufficient steel to fill the mold. The lower end of an ingot is sometimes called the butt of the ingot.

Hot Top or Sink Head.—A type of ingot cast in a mold the top of which is extended with refractory or nonconducting material designed to minimize the piping within the ingot proper.

Ingot Mold.—A cast metal form, either square or rectangular in section, and usually 6 feet or more in height, into which the molten steel is poured or teemed for the purpose of solidification. The mold rests on a cast metal stool or base, mounted on a buggy, for transfer to the stripper and soaking pits.

Ingot Stool.—The plate or base on which an open bottom ingot mold stands.

Inner Guard Rail.—A longitudinal member, usually a metal rail, secured on top of the ties inside of the track trail, to guide derailed car wheels.

Insulation.—A device or material that prevents the flow of electric current in a track circuit from passing from one rail to the other or through switches and other track structures.

Intake.—That portion of a pipe or other apparatus through which water enters from the source of supply, such as the end of an intake pipe. A structure built out into a body of water for the purpose of providing a place from which the water may be pumped without interruption.

Intercepting Ditch.—An open artificial waterway for diverting surface water from the natural course of flow.

Intermediate Sill.—A horizontal member in the plane of the trestle bent forming the cap of a lower section and the sill of an upper section.

Intrados.—The inner or concave surface of an arch.

Inventory (noun).—A list in detail of the units (land, roadway, and equipment) comprising the physical property of a carrier as of the date of valuation.

Inventory (verb).—The act of counting, computing, compiling, and recording fixed and movable property of a railway.

J

Joint, Rail.—A fastening designed to unite the abutting ends of contiguous rails.

Insulated.—A rail joint designed to arrest the flow of electric current from rail to rail by means of insulation so placed as to separate the rail ends and other metal parts connecting them.

Joint Bar.—A steel member, embodying beam-strength and stiffness in its structural shape and material; commonly used in pairs for the purpose of joining rail ends together, and holding them accurately, evenly, and firmly in position with reference to surface and gage-side alignment.

Joint Gap.—The distance between the ends of contiguous rails in track, measured at a point $\frac{5}{8}$ inch below the top of the rail on the outside of the head.

L

Ladle Test Ingot.—A small casting made when metal is teemed, to be used for chemical test purposes.

Lap.—A surface defect on metal appearing as a seam caused from folding over hot metal, fins, or sharp corners and then rolling or forging, but not welding them to the surface.

Lead.—The distance between the actual point of the switch and the half-inch point of the frog. (See Plans Basic Nos. 910 and 920 in the Portfolio of Trackwork Plans.)

Actual.—The length between the actual point of the switch and the half-inch point of the frog measured on the line of the parent track.

Curved.—The distance between the actual point of the switch and the half-inch point of the frog, measured on the outside gage line of the turnout.

Theoretical.—The distance from the theoretical point of a uniform turnout curve to the theoretical point of the frog, measured on the line of the parent track.

Lead Curve.—The curve in a turnout interposed between the switch and the frog.

Level.—The condition of the track in which the elevation of the two rails transversely is the same.

Line.—The condition of the track in regard to uniformity in direction over short distances on tangents, or uniformity in variation in direction over short distances on curves.

Lining Track.—Shifting the track laterally to conform to the established alignment.

Location.—The established position of the centerline and grade line of a railroad preparatory to its construction.

Longitudinal Strut of Girt.—A stiffening member running horizontally, or nearly so, from bent to bent.

Longitudinal X Brace.—A member extending diagonally from bent to bent in a vertical or battered plane.

M

Main Line.—The principal line or lines of a railway.

Main Track.—A track extending through yards and between stations, upon which

trains are operated by time table or train order, or both, or the use of which is governed by block signals.

Mate.—A track structure having a fixed or immovable point and used on the opposite side of the track from a tongue switch, as its companion piece. (A mate is termed “outside” or “inside” depending upon whether it is placed on the outside or inside of the curve, the “inside mate” being comparatively little used.)

Mattress.—A strong mat consisting of various materials, bound or woven together, used for the protection of the surface of the eroding banks or bottom of an alluvial river.

Ballast.—Stone riprap placed on any wood mattress to sink it and make it conform to the riverbed.

Brush and Wire Envelop.—Brush laid in two layers between woven wire netting which is tied together with wires. Bottom of netting envelop parallel to bank, top normal to bank. Bottom brush layer normal to bank, top parallel.

Milling Rail.—The cutting of the ends of rails with a milling hob to eliminate roughness and inaccuracies of sawing.

Modulus of Elasticity.—The ratio, within the elastic limit of a material, of unit stress to corresponding unit strain or deformation.

Mud-Sill or Sub-Sill.—A timber bedded in the ground to support a framed bent.

N

Normalizing.—Heating iron-base alloys to approximately 100° F above the critical temperature range followed by cooling to below that range in still air at ordinary temperature.

Nosing.—A transverse, horizontal motion of a locomotive which exerts a lateral force on the supporting structure.

O

Open-Hearth Furnace.—A rectangular furnace built of brick, lined with acid or basic materials and having a hearth on which metal is generally openly exposed to the action of burning gases.

Open-Hearth Process.—The conversion of solid pig iron with the addition of iron or steel scrap to steel through exposure to burning gases in a reverberatory furnace. In the refining of the molten metal, the carbon is generally reduced considerably below the percentage ultimately required and the metal is thereafter recarburized. Usually additions of manganese and silicon are also made.

Ordinary Break (Square or Angular Break).—Any partial or complete fracture in which there is no sign of a fissure, and in which none of the other defects or damage is visible.

Out of Face (Referring to Track Work).—Work that proceeds completely and continuously over a given piece of track as distinguished from work at disconnected points only.

P

Pass.—The passage of any piece of metal through the rolls of a rolling mill as an ingot through the blooming rolls; or the openings in the various rolls or roll trains, which give the hot metal the desired shape.

Percolation.—The act of water descending through the earth from the ground surface.

Permanent Set.—The strain or deformation remaining in a body after being stressed beyond the elastic limit.

Pig Iron.—The product, either cast or in a molten state, resulting from heating iron ore, limestone, and coke together in a blast furnace, after removal of the molten impurities as slag.

Pig iron contains a high percentage of carbon ranging from 3.0 to 4.0 percent.

Pile.—A member usually driven or jettied into the ground and deriving its support from the underlying strata, and by the friction of the ground on its surface.

The usual functions of a pile are: (a) To carry a superimposed load; (b) To compact the surrounding ground; (c) To form a wall to exclude water and soft material, or to resist the lateral pressure of adjacent ground.

Bearing.—One used to carry a superimposed load.

Butt of Pile.—The larger end of a pile.

Foot of Pile.—The lower end of a pile.

Head of Pile.—The upper end of a pile.

Tip of Pile.—The smaller end of a pile.

Pile Cap, Hood of Bonnet.—A block used to protect the head of a pile and to hold it in the leads during driving.

Pile Driver.—A machine for driving piles.

Pile Hammer.—A weight used to drive piles. It may be designated as a steam hammer, diesel hammer, or drop hammer, depending on the source of energy.

Pile Trestle.—A structure in which the upright members of supports are piles.

Piles, Anchor.—Piles driven on the land side of a bulkhead or pier to which the bulkhead or pier is anchored or tied by rods, cables, chains, or other devices.

Piped Rail.—One with a vertical split, usually in the web, due to failure of the sides of the shrinkage cavity in the ingot to unite in rolling.

Piping.—The formation of a cavity in the upper interior of an ingot, caused by shrinkage of the liquid metal when solidifying.

Pitting.—Localized corrosion.

Platform-Trucking.—A platform on which freight, baggage, mail, and express are handled to and from cars.

High.—A platform at or near car floor elevation.

Low.—A platform at or near top of rail elevation.

Plug, Tie.—Rectangular sections of wood, shaped somewhat like spikes, for driving into holes from which spikes have been withdrawn.

Post.—One of the vertical or battered members of the bent of a framed trestle.

Profile.—A line representing the ground surface or an established grade line, or both, in relation to the horizontal.

R

Rail Saw.—A power machine, provided with a saw of either tooth or friction type, used to cut steel rails.

Rail Section.—The shape of the end of a rail cut at right angles to its length. The rail mills identify the different shapes and types of rails by code numbers, as for example 131-28 for the 131 RE rail section.

Rail (Track).—A rolled steel shape, commonly a T-section, designed to be laid end to end in two parallel lines on crossties or other suitable supports to form a track for railway rolling stock.

Girder.—See Plans Basic Nos. 1002 and 1003 in the Portfolio of Trackwork Plans.

Tee.—See Plan Basic No. 1001 in the Portfolio of Trackwork Plans. Heavy Rails as used in the Portfolio: those sections weighing over 110 pounds per yard. Medium Weight Rails as used in the Portfolio: those sections weighing 80 to 110 pounds per yard., incl.

Railway Track Scale.—A scale especially designed for weighing railway equipment.

Retarder, Car.—A braking device, usually power operated, built into a railway track to reduce the speed of cars by means of brakeshoes which, when set in position, press

against the sides of the lower portions of the wheels.

Retarder, Inert.—A braking device, without external power, built into a railway track to reduce the speed of cars by means of brakeshoes against the sides of the lower portions of the wheels and sometimes provided with means for opening it to nullify its braking effect.

Right-of-Way.—Lands or rights used or held for railroad operation.

Roadbed Shoulder.—That portion of the subgrade lying between the ballast covered portion and the ditch in cuts and the top of slope on embankments.

Roadway Sign.—Any marker displayed on or near the right-of-way for instruction or information of employees or others.

Running Rail.—The rail or surface on which the tread of the wheel bears.

Runoff.—The term applied to that part of the precipitation which is carried off from the land upon which it falls.

S

Sash Brace.—A horizontal member secured to the posts or piles of a bent.

Scoremark.—An incision in a longitudinal surface of a hewed tie resulting from a stroke of the axe used in its manufacture.

Segregation-Positive.—The concentration of the carbon and impurities during solidification in the part of an ingot or other casting which solidifies last.

Negative.—The condition existing where any part of an ingot or casting has less than the average amount of carbon and impurities.

Self-Guarded Frog (Flange Frog).—A frog provided with guides or flanges, above its running surface, which contact the tread rims of wheels for the purpose of safely guiding their flanges past the point of the frog.

Settlement (noun).—The term settlement as applied to grading material is the reduction in elevation of an embankment caused by shrinkage or subsidence.

Shatter Cracks.—Minute cracks in the interior of rail heads, seldom closer than 1/2 inch from the surface, and visible only after deep etching or at high magnification. They may extend in any direction. They are caused by rapid (air) cooling, and may be prevented from forming by control cooling the rail. Shatter cracks also occur in other steel products.

Sheet Piles.—Piles driven in close contact in order to provide a tight wall, to prevent leakage of water and soft materials, or driven to resist the lateral pressure of adjacent ground.

Shim.—A small piece of wood or metal placed between two members of a structure to bring them to a desired relative elevation.

Shoe.—A metal protection for the point or foot of a pile.

Shoulder.—That portion of the ballast between the end of the tie and the toe of the ballast slope.

Shrinkage (noun).—The term shrinkage as applied to grading material is the difference in volume between the material excavated and the ultimate volume of the same material in the embankment after it has reached a state of equilibrium, when the latter is the smaller.

Skrinkage Allowance.—The excess length to which a hot rail is cut when leaving the rolls to allow for shrinkage to required length when cold.

Siding.—A track auxiliary to the main track for meeting or passing trains.

Sill.—The lowest horizontal member of a framed bent.

Skew.—Having an axis at any other angle than right.

- Angle of.*—The angular deviation of one of two intersecting lines from a right angle to the other.
- Slide.**—A superficial, gravitational earth movement.
- Slip Switch-Double.**—A combination of a crossing with two right-hand and two left-hand switches and curves between them within the limits of the crossing and connecting the two intersecting tracks on both sides of the crossing and without the use of separate turnout frogs.
- Single.*—A combination of a crossing with one right-hand and one left-hand switch and curve between them within the limits of the crossing and connecting the two intersecting tracks without the use of separate turnout frogs.
- Slope.**—The inclined face of a cutting or embankment.
- Slope Stakes.**—Stakes set to indicate the top or bottom of a slope.
- Snow Sweeper.**—A car equipped with brushes, near the rails, and the necessary machinery to revolve them; used for sweeping snow from the rails.
- Soaking Pit.**—A vertical reheating furnace in which the ingots, after being stripped, are placed in an upright position for the purpose of uniformly reheating them to the temperature required for rolling.
- Special Trackwork.**—All rails, track structures, and fittings, other than plain unguarded track that is neither curved nor fabricated before laying.
- Specification.**—That part of the contract describing the materials for or the details of construction.
- Spiral (When used with respect to track).**—A form of easement curve in which the change of degree is uniform throughout its length.
- Ten Chord.*—An approximate spiral measured in 10 equal chords and whose change of degree of curve is directly proportional to the length measured along the spiral by such chords.
- Splice Drilling.**—The spacing of holes in the ends of rails or other track structures to receive the bolts for the fastening of joint bars.
- Split Web.**—A longitudinal or diagonal transverse crack in the web of a rail.
- Spot Board.**—A sighting board placed above and across the track at the proposed height to indicate the new surface and insure its uniformity.
- Spring Washer.**—A member designed to prevent backward movement of the nut and looseness in the bolted members of a rail joint due to wear, stretch, rust, or other deterioration.
- Stamping.**—The figures and letters indented after hot sawing in the center of the rail web, parallel with the direction of rolling, indicating the serial heat number, the ingot number as cast or rolled, and one letter designating the position of each rail with reference to the top of the ingot.
- Steel.**—A ferrous material produced in a fluid condition, usually by the bessemer, open-hearth, electric furnace, or basic-oxygen process. It is practically free from slag, distinguishing it from wrought iron, and in general contains less than 1.70 percent of carbon, distinguishing it from cast iron.
- Stock-Guard.**—A barrier of wood, metal, or other material placed between and alongside of track rails to prevent the passage of livestock on or along the railroad track or tracks.
- Stock Rail.**—A running rail against which the switch rail operates.
- Stock Rail Bend.**—The bend or set which must be given the stock rail at the vertex of a switch to allow it to follow the gage line of the turnout.

Stress.—The sum of the forces acting in the interior of a body which resist external forces tending to change its form or shape. Stress is measured in force per unit area (pounds per square inch, kilograms per square millimetre, etc.).

Stringer.—A longitudinal member extending from bent to bent and supporting the track.

Subballast.—Any material of a superior character, which is spread on the finished subgrade of the roadbed and below the top ballast, to provide better drainage, prevent upheaval by frost, and better distribute the load over the roadbed.

Subdrain.—A covered drain, below the roadbed or ground surface, receiving water along its length through perforations or joints.

Subgrade (noun).—The finished surface of the roadbed below the ballast and track.

Subsidence (noun).—That portion of an embankment which has settled below the original surface of the ground.

Subsurface Drainage.—The control and removal of excess moisture contained in the soil.

Surface (Track).—The condition of the track as to vertical evenness or smoothness.

Running (Tread).—The top part of track structures on which the treads of the wheels bear.

Sway Brace.—A member bolted or spiked to a bent and extending diagonally across its face.

Sweep, Rail.—Two flexible parts attached to the front of a track car in such a location as to brush from the rail, as the car moves forward, any easily removable obstruction on the top of the rail.

Swell.—The term swell as applied to grading material is the difference in volume of the same material in the embankment after it has reached a state of equilibrium, when the latter is the greater.

Switch.—A track structure used to divert rolling stock from one track to another.

Split.—A switch consisting essentially of two movable point rails with the necessary fixtures.

Split, with Uniform Risers.—A split switch in which the switch rails have a uniform elevation on riser plates for the entire length of the switch, and therefore not having a heel slope, the point rail rise being run off back of the switch in the closure rails.

Split, with Graduated Risers.—A split switch in which the switch rails are gradually elevated by means of graduated riser plates until they reach the required height above the stock rail, and therefore having a heel slope.

Split, Manganese Tipped.—A split switch in which the head of one or both of the switch rails is cut away in the point portion and manganese steel pieces fastened to the rail to form the point.

Split, Insulated.—A switch in which the fixtures, principally the gage plates and the switch rods, connecting or reaching from one rail to the opposite rail are provided with insulation so that the electric track circuit will not be shunted.

Spring.—A switch in the operating mechanism of which is incorporated a spring device so arranged as to automatically return the points to their original or normal position after they have been thrown over by the flanges of trailing wheels passing along the other track from that for which the points are set for facing movements.

Tongue.—A switch piece consisting essentially of a movable tongue with a suitable enclosing and supporting body structure, designed for use on one side of the track while on the other side there is used either a mate or another tongue switch. (A tongue switch is termed

- "inside" or "outside" depending upon whether it is placed on the inside or on the outside of the curve, the "outside tongue switch" being comparatively little used.)
- Angle.*—The angle included between the gage lines of the switch rail at its point and the stock rail.
- Detector Bar.*—A strip of metal mounted alongside the track rail and connected with the throwing mechanism of the switch to prevent the moving of the switch under trains.
- Head Separation.*—The point on a switch rail where the head of the rail attains its full width.
- Heel of.*—That end of a switch rail which is the farther from its point, and nearer the frog.
- Heel Spread.*—The distance, at the heel, between the gage line of a switch rail and the gage line of its stock rail. (This has been standardized at 6-1/4 inches for straight switches.)
- Heel Slope.*—The inclination produced by graduated risers in that part of the switch which reduced the elevation (as the height of the risers decreases) toward the heel of the switch.
- Point of, Actual.*—That end of the switch rail which is the farther from the frog; the point where the spread between the gage lines of the stock rail and the switch rail is sufficient for a practicable switch point.
- Point of, Theoretical or Vertex.*—The point where the gage line of the switch rail, if produced, would intersect the gage line of the stock rail.
- Point Rail, Switch Rail, or Switch Point.*—The tapered rail of a split switch.
- Point Rail Rise.*—The elevation of a switch rail to allow the overhanging part of hollowed-out treads of worn wheels to pass over the stock rail.
- Planing, Bottom.*—The cut planed at an angle on the bottom of the base of the switch rail from the point and toward the heel to allow the switch rail to rest on the top of the base of the stock rail when the switch rail is closed.
- Planing, Side.*—The cuts made on the sides of the head of the switch rail to form the taper.
- Planing, Top.*—The cut made on the top of the head of the switch rail from the point and to approximately the head separation.
- Planing, Chamfer Cut.*—The vertical beveling of the gage side of the switch point to produce a sharp edge, so as to prevent wheel flanges from striking the point.
- Rail Brace.*—A metal shape designed to fit the contour of the side of the stock rail and extend over the switch plate, with provision for fastening through the plate to the tie, to restrain the movement of the stock rail.
- Rail Brace, Adjustable.*—A rail brace which may be adjusted laterally with respect to the stock rail, to compensate for variations in the dimensions of the rail and to permit of adjusting for wear.
- Throw of.*—The distance through which the points of switch rails are moved sidewise, measured along the centerline of the No. 1 switch rod or head rod. (This distance is standardized at 4-3/4 inches.)
- Switch Point Derail.**—A derail consisting essentially of a split switch point with the necessary fixtures.
- Switch Stand.**—A device for the manual operation of switches, or of movable center points.

T

Tangent.—Any straight portion of a railway alignment.

Tapping.—The removal of the molten steel from the open-hearth furnace by opening the tap hole and allowing the metal to run into the ladle.

Teeming.—The pouring of molten steel from the ladle into ingot molds.

Templet.—Usually a piece of thin metal of the exact size and shape of the rail section when hot, or the reverse of the shape to be fitted over a hot or cold rail to check its shape.

Fishing.—A templet shaped to fit between the head and base of the rail and used to determine whether the rail section is accurately formed in the fishing spaces to receive the joint bars.

Tensile Strength.—The maximum tensile stress which a material is capable of sustaining.

Tie, Adzed.—A tie which has had the plate-bearing areas of its top made plane and smooth by passage through a machine designed for the purpose.

Bored.—A tie which has had holes for spikes provided by passage through a machine designed for the purpose.

Cross.—The transverse member of the track structure to which the rails are spiked or otherwise fastened to provide proper gage and to cushion, distribute, and transmit the stresses of traffic through the ballast to the roadbed.

Grooved.—A crosstie which has had machine-gouged depressions across its top into which ribs on the bottom of a tie plate may fit.

Heart.—A tie with sapwood no wider than one-fourth the width of the top of the tie between 20 and 40 inches from the middle of the tie.

Sap.—A tie with sapwood wider than one-fourth the width of the top of the tie between 20 and 40 inches from the middle of the tie.

Slabbed.—A tie sawed on top and bottom only. (Known also as “pole” tie and “round” tie.)

Substitute.—A tie of any material other than wood or of wood in combination with any other material.

Switch.—The transverse member of the track structure which is longer than but functions as does the crosstie and in addition supports a crossover or turnout.

Tie Plate.—A plate interposed between a rail or other track structure and a tie.

Toe of Slope.—The intersection of a slope with the ground surface in embankments, and the plane of roadbed in cuts.

Tolerance.—An allowable variation from dimensions or requirements specified.

Topballast.—Any material of a superior character spread over a subballast to support the track structure, distribute the load to the subballast, and provide a good initial drainage.

Top of Slope.—The intersection of a slope with the ground surface in cuts, and the plane of roadbed on embankment.

Track.—An assembly of rails, ties, and fastenings over which cars, locomotives, and trains are moved.

Body.—Each of the parallel tracks of a yard upon which cars are placed or stored.

Classification.—One of the body tracks in a classification yard, or a track used for classification purposes.

Connecting.—Two turnouts with the track between the frogs arranged to form a continuous passage between one track and another intersecting or oblique track or another remote parallel track.

Crossover.—Two turnouts with track between, connecting two nearby and usually parallel tracks.

Departure.—One of the tracks in a departure yard on which outgoing cars are placed.

Drill.—A track connecting with the ladder track, over which locomotives and cars move back and forth in switching.

Hold.—One of the body tracks in a hold yard or a track used for hold purposes.

House.—A track alongside of, or entering a freight house, and used for cars receiving or delivering freight at the house.

Interchange.—A track on which cars are delivered or received, as between railways.

Ladder.—A track connecting successively the body tracks of a yard.

Lead.—An extended track connecting either end of a yard with the main track.

Passing.—A track auxiliary to the main track for meeting or passing trains. Same as a **Siding**.

Repair.—A track on which cars are placed for repairs.

Running.—A track reserved for movement through a yard.

Scale.—A track leading to and from and passing over a track scale.

Side.—A track auxiliary to the main track for purposes other than for meeting and passing trains.

Sorting.—One of the body tracks in a sorting yard or a track used for sorting purposes.

Spur.—A stub track diverging from a main or other track.

Storage.—One of the body tracks in storage yards or one of the tracks used for storing equipment.

Stub.—A track connected with another one at one end only.

Team.—A track on which cars are placed for transfer of freight between cars and highway vehicles.

Wye.—A triangular arrangement of tracks

on which locomotives, cars, and trains may be turned.

Track Bolt.—A bolt with a button head and oval, or elliptical, neck and a threaded nut designed to fasten together rails and joint bars.

Track Capacity.—The number of cars that can stand in the clear on that track.

Transverse Defect.—For defects found by detector cars, a tentative group classification, applied prior to the breaking of the rails, of all types of rail defects which have transverse components, such as transverse fissures (TF), compound fissures (CF), and detail fractures (DF).

Transverse Fissure.—A progressive crosswise fracture starting from a crystalline center or nucleus inside the head from which it spreads outward as a smooth, bright or dark, round or oval surface substantially at a right angle to the length of the rail. The distinguishing features of a transverse fissure from other types of fractures or defects are the crystalline center or nucleus and the nearly smooth surface of the development which surrounds it.

Tread.—The top surface of the head of a rail which contacts wheels.

Turnout.—An arrangement of a switch and a frog with closure rails, by means of which rolling stock may be diverted from one track to another.

Equilateral.—A turnout in which the diversion due to the angle of the turnout is divided equally between the two tracks.

Lateral.—A turnout in which the diversion due to the angle of the turnout is entirely on one side of the track from which the turnout is made.

Turnout Number.—The number corresponding to the frog number of the frog used in the turnout.

V

Vertical Split Head.—A split along or near middle of the head of a rail and extending into or through it. A crack or rust streak may show under the head close to the web, or pieces may be split off the side of the head.

W

Waste of Spoil Banks.—Banks outside the roadway formed by waste.

Welded Rail.—Two or more rails welded together to form a length less than 400 feet (CWR). (See also Continuous Welded Rail.)

Wing Fence.—A fence connecting the apron of the stockguard with the right-of-way or line fence.

Wingwall.—An extension of an abutment wall to retain the adjacent earth.

Wood Trestle.—A wood structure composed of bents supporting stringers, the whole forming a support for loads applied to the stringers through the deck.

Wrought Iron.—A ferrous material, aggregated from a solidifying mass of pasty particles of highly refined metallic iron, with which, without subsequent fusion, is incorporated a minutely and uniformly distributed quantity of slag.

Wye.—A triangular arrangement of tracks on which locomotives, cars, and trains may be turned.

Y

Yard.—A system of tracks within defined limits provided for making up trains, storing cars, and other purposes, over which movements not authorized by time table or by train-order may be made, subject to prescribed signals and rules, or special instructions.

Capacity-Standing.—The sum of the capacities of all the tracks in that yard on which cars may be permitted to stand.

Classification.—A yard in which cars are classified or grouped in accordance with requirements.

Departure.—A yard in which cars are assembled in trains for forwarding.

Hold.—A yard for the temporary holding of cars.

Receiving.—A yard for receiving cars.

Storage.—A yard in which idle equipment is held awaiting disposition.