

19 Railway, road and bridge construction

19a	Permanent way, permanent-way tools and machines for building railways of all kinds
19a	(IPC: E01B) Permanent way; Permanent way tools; Machines for making railways of all kinds
19b	Cleaning of roads and traffic areas, including playgrounds and playing fields
19b	(IPC: E01H) Street cleaning; Cleaning of permanent ways; Cleaning beaches; Dispersing fog in general
19c	Paving of roads and traffic areas, playgrounds and playing fields
19c	(IPC: E01C) Construction of and surfaces for roads, sports grounds, or the like; Machines and auxiliary tools for construction and repair
19d	Bridge construction
19d	(IPC: E01D) Construction of bridges or viaducts; assembly of bridges
19e	Substructure for streets and railways, including auxiliary installations
19e	(IPC: E01F) Additional work, such as equipping roads or the construction of platforms, helicopter landing stages, signs, snow fences, etc.
19f	Tunnel construction
19f	(IPC: E01G) Building of tunnels
19a	Permanent way (switches 20i, special devices for electric traction 20k), permanent-way tools and machines for building railways of all kinds
	Rail ballasting for tracks of all kinds (19c-1 – 19c-7)
19a-1/01	Permanent-way drainage
19a-1/02	Devices to prevent creeping of the entire track (19a-14) and dust formation
19a-1/03	Sound-damping devices, especially tie plates of elastic or sound-damping materials (19a-8; 37a-7/01; 37b-6)
19a-1/04	Permanent-way equipment at grade crossings and for preventing access to tracks outside of crossings, e.g. near cattle guards
	Ties for main and secondary railway lines
19a-2	Wooden ties and stringers, also iron-armoured or iron-connected wooden crossties, devices against crosstie splitting, crosstie plugs, etc.
19a-3	Iron crossties
19a-4	Iron stringers and combined stringers and crossties
19a-5	Isolated supports
19a-6	Ties of artificial stone, reinforced concrete, etc. (37a-2; 37b-1 – 37b-5; 80a-51; 80b)
	Rails and rail fastenings for main and secondary railway lines
19a-7/01	Rails and guard rails and their spacers and joints (19a-13; 19a-20)

19a-7/10	Switches
19a-7/12	Rigid frogs
19a-7/14	Movable frogs
19a-7/16	Rail crossings
19a-7/18	Inclined-plane switches
19a-7/25	Switch heating
19a-7/30	Switch points and their fastening
19a-7/32	Spring-point switches
19a-8	Tie plates and rail fastening to same in wooden crossties (19a-1; 19a-11; 19a-22; rail insulations 20k-8)
19a-9	Rail chairs for wooden and iron crossties (the latter also 19a-11) and fastening of the rails in the chairs
19a-10	Fastening of rails, guard rails, tie pads and chairs by means of rail spikes and rail or tie bolts to wooden crossties (49l-13; nails and screws, general 47a-4 – 47a-8; screw locks, general 47a-9 – 47a-15), head supports and cross connections or rail braces in wooden tie permanent ways
19a-11	Fastening of the rails and guard rails to iron crossties and changing of the gage (49l-13; screw locks, general 47a-9 – 47a-15)
19a-12	Fastening of the rails to iron stringers and isolated supports, cross connections or rail braces in stringer and isolated support permanent ways (19a-10; 19a-22)
19a-13	Tie rails and composite rails (19a-7/01; 19a-20), their fastening and connection
19a-14	Means to prevent rail creeping (19a-1)

Rail-joint connections for main and secondary railway lines

19a-15	Rail joints in general, ordinary splice joints, splice bars with supporting flanges and adjustable wedges between the rails and the plates, fish-screw locks (19a-10; 19a-11; conductor-rail connections and rail insulation 20k-7, 20k-8; screw locks, general 47a-9 – 47a-15)
19a-16	Splice-bar joints with bevelled rail, ends, and joint connections with overlap or scarf joints, interlocking and bolting of the rail ends and expansion joints
19a-17	Impact-absorbing splice bars and impact-absorbing rails
19a-18	Bridge plates 19a-16; 19a-19)
19a-19	Splice bars of special structure: bull-headed splice bars, saddle splice bars, continuous splice bars, cranked splice bars, emergency splice bars

Tracks for narrow gage and industrial railways

19a-20	Streetcar rails (19a-7/01; 19a-13; 20k-1 – 20k-8)
19a-21	Streetcar tracks in general (19c-7), streetcar-line ties (19a-2 – 19a-6), drainage of streetcar tracks (19c-7)
19a-22	Rail fastenings and rail-joint connections for streetcar lines; cross connections or rail braces for streetcar tracks (19a-10; 19a-12)
19a-23/01	Tracks for unusual rail systems, i. e. steep-grade lines, cableways, especially carrying cables and their supports, fastening and tensioning, towed railways, monorails, elevated railways, etc. (20a-2 – 20a-17; 20k-1 – 20k-8; 73-1; 73-4; 81e-23; 81e-24; 81e-27; 81e-117; 81e-118; 81e-145 – 81e-157)
19a-23/10	Switches, frogs and crossings for suspended, cable and rack railways (20g-1/03)
19a-24	Track for field, forest and mine railways, and other readily movable railways
19a-25	Tracks and track systems of all kinds, also for street vehicles (19c-1 – 19c-7; 20a-1)
19a-26	Rail fastenings and joint connections for tracks of all kinds, welded soldered, etc. (20k-7; 21h-29 – 21h-32; 49h-25 – 49h-37), repairing worn rails and rail joints

Permanent-way apparatus and machines for switchless rail tracks of all kinds

	Track-construction and maintenance apparatus, also track construction
19a-27/01	Track-laying machines (20c-8), rail and cross tie shifting machines

19a-27/02	Ballast tools and machines, cribbing of old ballast, ballast cleaning, ballast distribution, levelling, tamping devices, feed pans, ballast rollers (19c-8)
19a-27/03	Track-laying and ballasting machines
	Mobile devices and portable tools for shifting the track
19a-28/01	Rail cutters, rail saws
19a-28/02	Rail benders
19a-28/03	Rail drills (49a-38 – 49a-53)
19a-28/04	Rail lifters, track lifters (35d)
19a-28/05	Rail straighteners
19a-28/06	Rail slewers, along, and perpendicularly to, the rail direction
19a-28/07	Rail carriers, rollers, tongs
19a-28/08	Tie working devices for preparing the tie plate seats, tie milling apparatus, crosstie planes (38b)
19a-28/09	Tie drills (38b-4; 38b-8), plug drills, plug driving tools, bore gages
19a-28/10	Tie lifters (35d)
19a-28/11	Tie straighteners
19a-28/12	Tie slewers in tie and track direction, tie changers
19a-28/13	Tie carrying devices, tie tongs
19a-28/14	Devices for driving and pulling rail spikes and screws (87a-17; 87a-18), rail-bolt tongs, etc.
19a-28/15	Devices for the mechanical and chemical removal of weeds along the track (45a-2; 45a-3; 45a-19) Track slewing machines and mechanical track slewing
19a-28/50	Track slewing devices, track-end slewing devices
19a-28/51	Outrigger track-slewing machines for excavator tracks
19a-28/52	Bridge track-slewing machines for excavator tracks
19a-28/53	Combined outrigger and bridge track-slewing machines
19a-28/54	Tilting track-slewing machines, outrigger track slewing machines, bridge track-slewing machines, embankment track-shifting machines
19a-28/55	Forcing rollers, lifting rollers, pushing rollers
19a-28/56	Forcing roller suspension, forcing rollers elastically adjustable to gage width, forcing rollers elastically adjustable to rail head, forcing roller frames and their suspension
19a-28/57	Packing devices, levelling devices for excavator-track slewing machines and for tilting-track slewing machines
19a-28/58	Variable shifting track-slewing machines
19a-29/01	Gage and slope measuring instruments to be attached to the track (42b-10; 42b-24; 42c)
19a-29/02	Mobile gage and slope measuring devices (42d)
19a-30/01	Tie tampers as hand tools (87b-1; 87b-2; 87b-3), tamping picks
19a-30/02	Mobile tie tampers
19a-31	Mobile and portable rail-filing, milling and planing machines for laid rails and rail joints (49b-1; 49b-5; 49c-1 – 49c-9; 67a-31)

19a (IPC: E01B) Permanent way; Permanent way tools; Machines for making railways of all kinds

Structure of the permanent way for railways or tramways

19a-1/00	Ballastway; Other means for supporting the sleepers or the track; Drainage of the ballastway (draining by trenches, culverts, or conduits 19e-5/00)
19a-1/02	. for railway lines
19a-1/04	. for tram lines

19a-3/00	Transverse or longitudinal sleepers (for switches or crossings 19a-7/22); Other means resting directly on the ballastway for supporting rails
19a-3/02	. made from wood (manufacture of wooden sleepers 38k; drying or impregnating 38h)
19a-3/04	. . Means for preventing cleaving
19a-3/06	. . . Anti-cracking dogs
19a-3/08	. . . Straps or bands for hooping or encircling sleepers (apparatus for hooping wooden railway sleepers on the spot 19a-31/28)
19a-3/10	. . Composite sleepers
19a-3/12	. . Longitudinal sleepers; Longitudinal sleepers integral or combined with tie-rods; Combined longitudinal and transverse sleepers
19a-3/14	. . Slabs; Blocks; Fastening tie-rods to them
19a-3/16	. made from steel
19a-3/18	. . Composite sleepers
19a-3/20	. . Sleeper construction for special purposes, e.g. with openings for ballast working (sleepers for shiftable track for heavy loads 19a-23/12)
19a-3/22	. . Longitudinal sleepers; Longitudinal sleepers integral or combined with tie-rods; Combined longitudinal and transverse sleepers
19a-3/24	. . Slabs; Blocks; Pot sleepers; Fastening tie-rods to them
19a-3/26	. . combined with inserts of wood, artificial stone, or other material
19a-3/28	. made from concrete or from natural or artificial stone (manufacture 80)
19a-3/30	. . Hollow sleepers
19a-3/32	. . with armouring or reinforcement (hollow sleepers 19a-3/30)
19a-3/34	. . . with pre-tensioned armouring or reinforcement (pre-tensioned armouring or reinforcing elements 37a)
19a-3/36	. . Composite sleepers
19a-3/38	. . Longitudinal sleepers; Longitudinal sleepers integral or combined with tie-rods; Combined longitudinal and transverse sleepers; Layers of concrete supporting both rails
19a-3/40	. . Slabs; Blocks; Pot sleepers; Fastening tie-rods to them
19a-3/42	. . combined with inserts of wood or other material
19a-3/44	. made from other materials only if the material is essential
19a-3/46	. made from different materials (19a-3/26, 19a-3/42 take precedence)
19a-3/48	. Distance keepers or tie-rods for sleepers
19a-5/00	Rails; Guard rails (manufacture of rails 7a); Distance-keeping means for them
19a-5/02	. Rails
19a-5/04	. . Grooved rails
19a-5/06	. . Reversible or invertible rails
19a-5/08	. . Composite rails; Compound rails with dismountable or non-dismountable parts
19a-5/10	. . . Composite grooved rails; Inserts for grooved rails
19a-5/12	. . Rails with a foot serving as a sleeper
19a-5/14	. . Rails for special parts of the track, e.g. for curves
19a-5/16	. Distance keepers
19a-5/18	. Guard rails; Connecting, fastening or adjusting means therefor
19a-7/00	Switches; Crossings (operating mechanisms 20i)
19a-7/02	. Tongues; Associated constructions
19a-7/04	. . Constructions with tongues turning about a vertical pivot at the end
19a-7/06	. . Constructions with flexible tongues or flexible fishplates
19a-7/08	. . Other constructions of tongues, e.g. tilting about an axis parallel to the rail, movable tongue blocks or rails
19a-7/10	. Frogs
19a-7/12	. . Fixed frogs made of one part or composite
19a-7/14	. . with movable parts
19a-7/16	. . Jump-over frogs
19a-7/18	. Combinations of switches and crossings
19a-7/20	. Safety means for switches, e.g. switch point protectors, auxiliary or guiding rail members
19a-7/22	. Special sleepers for switches or crossings; Fastening means therefor
19a-7/24	. Heating of switches

19a-7/26	. . Lubricating of switches (lubricating of rails 20h)
19a-7/28	. Crossings
19a-7/30	. . Jump-over crossings
19a-9/00	Fastening rails on sleepers, etc. (fastening rails to bridges 19d-19/12)
19a-9/02	. Fastening rails, tie-plates, or chairs directly on sleepers or foundations; Means therefor
19a-9/04	. . Fastening on wooden or concrete sleepers or on masonry without clamp members
19a-9/06	. . . Railways spikes (nails in general 47a)
19a-9/08	. . . . Elastic spikes
19a-9/10	. . . Screws or bolts for sleepers (screws or bolts in general 47a)
19a-9/12	. . . Retaining or locking devices for spikes or screws
19a-9/14	. . . Plugs, sleeves, thread linings, or other inserts for holes in sleepers (inserting plugs or sleeves 19a-31/26)
19a-9/16	. . . . for wooden sleepers
19a-9/18	. . . . for concrete sleepers
19a-9/20	. . . by keys
19a-9/22	. . Fastening on steel sleepers without clamp members
19a-9/24	. . . by keys
19a-9/26	. . . Welded fastenings
19a-9/28	. . Fastening on wooden or concrete sleepers or on masonry with clamp members
19a-9/30	. . . by resilient steel clips
19a-9/32	. . Fastening on steel sleepers with clamp members
19a-9/34	. . . by resilient steel clips
19a-9/36	. . Metal sole-plates for rails which rails are directly fastened to sleepers
19a-9/38	. Indirect fastening of rails by using tie-plates or chairs; Fastening of rails on the tie-plates or in the chairs
19a-9/40	. . Tie-plates for flat-bottom rails (manufacture 7f)
19a-9/42	. . . of two or more parts
19a-9/44	. . Fastening the rail on the tie-plate
19a-9/46	. . . by clamps
19a-9/48	. . . . by resilient steel clips
19a-9/50	. . . by keys
19a-9/52	. . . . by resilient keys
19a-9/54	. . Rail chairs
19a-9/56	. . . for rails with two or more treads
19a-9/58	. . Fastening the rail in the chair
19a-9/60	. Rail fastenings making use of clamps or braces supporting the side or head of the rail
19a-9/62	. Rail fastenings incorporating resilient supports
19a-9/64	. Rail fastenings gripping or encircling the sleeper
19a-9/66	. Rail fastenings allowing the adjustment of the position of the rails so far as not included in the preceding groups
19a-9/68	. Pads or the like, e.g. of wood, rubber, placed under the rail, tie-plate, or chair
19a-11/00	Rail joints (electrical connection of rails 20k)
19a-11/02	. Dismountable rail joints
19a-11/04	. . Flat fishplates
19a-11/06	. . . with keys or pins
19a-11/08	. . Angle fishplates
19a-11/10	. . Fishplates with parts supporting or surrounding the rail foot
19a-11/12	. . Fishplates engaging only the rail foot
19a-11/14	. . Rail foot flange clips in one piece
19a-11/16	. . Fishplates for joining rails of different sections
19a-11/18	. . Fishplates for temporarily repairing broken rails
19a-11/20	. . with gap-bridging
19a-11/22	. . . by parts of the rails
19a-11/24	. . . . with oblique or overlapping rail ends
19a-11/26	. . . . with interlocking rail ends
19a-11/28	. . . by parts of the joining members
19a-11/30	. . . . Fishplates with integral tread parts lying in the cross-section of the rail head

- 19a-11/32 . . . by separate parts; Inserts bridging both rail heads
- 19a-11/34 Auxiliary rail beside the gap
- 19a-11/36 . . Fastening means for fishplates
- 19a-11/38 . . . Locking arrangements for fastening means (locking means for nuts or bolts in general 47a)
- 19a-11/40 . . Dismountable rail joints combined with welded parts
- 19a-11/42 . Joint constructions for relatively movable rails, e.g. rails on turn-tables, traversers, or swing bridges
- 19a-11/44 . Non-dismountable rail joints; Welded joints
- 19a-11/46 . . General methods for making gapless tracks
- 19a-11/48 . . Joints made by flame welding
- 19a-11/50 . . Joints made by electric welding
- 19a-11/52 . . Joints made by alumino-thermal welding
- 19a-11/54 . Special arrangements for supporting rail ends (foot supports 19a-11/08 – 19a-11/14)
- 19a-11/56 . . Bridge plates
- 19a-11/58 . . . with wedges
- 19a-11/60 . . Bridge chairs (chairs 19a-9/54 – 19a-9/58)
- 19a-11/62 . . Bridge chairs (chairs 19a-9/54 – 19a-9/58)

- 19a-13/00 Arrangements preventing shifting of the track**
- 19a-13/02 . Rail anchors

- 19a-15/00 Guards for preventing a person's foot being trapped in grooved rails**

- 19a-17/00 Cattle guards connected to the permanent way** (grids in general for preventing cattle from straying 45h)

- 19a-19/00 Protection of permanent way against development of dust or against the effect of wind, sun, frost, or corrosion; Means to reduce development of noise** (snow fences 19e-7/02; snow-ploughs 19b-8/02; watering 19b-11/00)

- 19a-21/00 Track superstructure specially adapted for tramways in paved streets** (paving 19c-9/04, 19c-9/06)
- 19a-21/02 . Special supporting means; Draining of rails
- 19a-21/04 . Special fastenings, joint constructions, or tie-rods

- 19a-23/00 Easily dismountable or movable tracks, e.g. temporary railways; Details specially adapted therefor**
- 19a-23/02 . Tracks for light railways, e.g. for field, colliery, or mine use
- 19a-23/04 . . Fastening or joining means
- 19a-23/06 . . Switches (turn-tables 20g); Portable switches; Turnouts
- 19a-23/08 . Temporary tracks for use while repairing tramways
- 19a-23/10 . Shiftable tracks for heavy loads, e.g. carrying excavators
- 19a-23/12 . . Sleepers
- 19a-23/14 . . Fastening or joining means (fastening of rails by keys 19a-9/24)
- 19a-23/16 . . Switches

- 19a-25/00 Tracks for special kinds of railways** (systems 20a; wheel tracks on roads 19c-9/02)

Note:

In this group the term "track" includes non-load-carrying guide rails.

- 19a-25/02 . Tracks for rack railways
- 19a-25/04 . . Rack rails; Supports or connections for rack rails
- 19a-25/06 . . Switches; Frogs; Crossings
- 19a-25/08 . Tracks for mono-rails with centre of gravity of vehicle above the load-bearing rail
- 19a-25/10 . . Mono-rails; Auxiliary balancing rails; Supports or connections for rails
- 19a-25/12 . . Switches; Crossings
- 19a-25/14 . Tracks for cable-drawn railway vehicles
- 19a-25/15 . . Switches; Crossings
- 19a-25/16 . Tracks for aerial rope railways with a stationary rope
- 19a-25/18 . . Ropes; Supports, fastening or straining means for ropes (masts 37b; rope sockets 47d; ropes in general 73)

19a-25/20	. . Switches; Crossings
19a-25/22	. Tracks for railways with the vehicle suspended from rigid supporting rails
19a-25/24	. . Supporting rails; Auxiliary balancing rails; Supports or connections for rails
19a-25/26	. . Switches; Crossings
19a-25/28	. Rail tracks for guiding vehicles when running on road or similar surface (wheel tracks on roads 19c-9/02)
19a-26/00	Tracks or track components not covered by any one of the preceding groups
<u>Making, maintaining, renewing, or taking-up the ballastway or the track; Tools or machines specially designed therefor</u>	
19a-27/00	Placing, renewing, working, cleaning, or taking-up the ballast, with or without concurrent work on the track; Devices therefor; Packing sleepers
19a-27/02	. Placing the ballast; Making the ballastway; Redistributing ballasting material; Machines or devices therefor; Levelling means
19a-27/04	. Removing the ballast; Machines therefor, whether or not additionally adapted for taking-up ballast (19a-27/06, 19a-27/12 take precedence; redistributing ballasting material 19a-27/02)
19a-27/06	. Renewing or cleaning the ballast in situ, with or without concurrent work on the track
19a-27/08	. . the track having been taken-up (19a-27/11 takes precedence)
19a-27/10	. . without taking-up the track (19a-27/11 takes precedence)
19a-27/11	. . combined with concurrent renewal of track components
19a-27/12	. Packing sleepers, with or without concurrent work on the track; Compacting track-carrying ballast
19a-27/13	. . Packing sleepers, with or without concurrent work on the track (preforming ballast cores or seats for sleepers 19a-27/02)
19a-27/14	. . . Manual tools or hand-held power tools therefor
19a-27/16	. . . Machines therefor, e.g. so-called sleeper-tamping machines
19a-27/17	. . . . combined with means for lifting, levelling, or slewing the track
19a-27/18	. . . by introducing additional fresh material under the sleepers, e.g. by the measured-shovel method, by the blowing method
19a-27/20	. . Compacting the materials of the track-carrying ballastway, e.g. by vibrating the track, by surface vibrators (of trackless ballastway 19a-27/02; for packing sleepers 19a-27/12)
19a-29/00	Laying, rebuilding, or taking-up tracks; Tools or machines therefor (19a-27/00, 19a-31/00 take precedence)
19a-29/02	. Transporting, laying, removing, or renewing lengths of assembled track, assembled switches, or assembled crossings (19a-29/04 takes precedence)
19a-29/04	. Lifting or levelling of tracks (lifting devices in general 35d)
19a-29/05	. Transporting, laying, removing, or renewing both rails and sleepers (as assembled units 19a-29/02)
19a-29/06	. Transporting, laying, removing, or renewing sleepers
19a-29/08	. . Tools for handling sleepers
19a-29/09	. . under, or from under, installed rails
19a-29/10	. . . for inserting or removing sleepers
19a-29/11	. . . . Removal involving destruction of the sleeper, e.g. the sectioning thereof
19a-29/12	. . . for moving or adjusting laid sleepers
19a-29/13	. . . for moving sleepers in a direction parallel to the rails, e.g. for spacing or aligning them (19a-29/10 takes precedence)
19a-29/14	. . . for lifting sleepers up to the rails (lifting devices in general 35d)
19a-29/16	. Transporting, laying, removing, or replacing rails; Moving rails placed on sleepers in the track
19a-29/17	. . Lengths of rails assembled into strings, e.g. welded together
19a-29/20	. . Moving rails placed on installed sleepers in the plane of the track
19a-29/22	. . Raising rails from sleepers, e.g. for inserting sole-plates (lifting devices in general 35d)

19a-29/24	. Fixing or removing detachable fastening means or accessories thereof; Pre-assembling track components by detachable fastening means (19a-29/02, 19a-31/26 take precedence)
19a-29/26	. . the fastening means being spikes (19a-29/16 takes precedence; portable tools for nail or staple driving or extracting B25C)
19a-29/28	. . the fastening means being of screw-and-nut type (portable apparatus for fixing or removing screws or the like B25B); Apparatus therefor, adapted to additionally drilling holes
19a-29/29	. . . for horizontally-arranged fastening elements, e.g. fish-bolts
19a-29/30	. . Installing or removing other fastening means
19a-29/32	. Installing or removing track components, not covered by the preceding groups, e.g. sole-plates, rail anchors (19a-31/26 takes precedence)
19a-29/34	. Measuring devices for track laying (measuring devices for railway operation 20h)
19a-29/36	. . Track templates; Inclinometers (measuring in general 42)
19a-29/38	. . Transportable measuring devices
19a-29/40	. Means or arrangements for temporarily supporting laid tracks, or rails or sleepers in the track (temporary fishplates 19a-11/18)
19a-29/42	. Undetachably joining or fastening track components in or on the track, e.g. by welding, by gluing; Pre-assembling track components by gluing; Sealing joints with filling components (19a-31/26 takes precedence; independent heating means 19a-31/18; gluing metal parts per se 47a1-11/00)
19a-29/44	. . Methods for effecting joining of rails in the track, e.g. taking account of ambient temperature
19a-29/46	. . Devices for holding, positioning, or urging together the rail ends (adjusting the joint by moving rails 19a-29/20)
19a-31/00	Working rails, sleepers, baseplates, or the like in or on the line; Machines, tools, or auxiliary devices specially designed therefor
19a-31/02	. Working rail or other metal track components on the spot
19a-31/04	. . Sectioning or slitting, e.g. by sawing, shearing, flame-cutting
19a-31/06	. . Making holes, e.g. by drilling, punching, flame-cutting
19a-31/08	. . Bending, e.g. for straightening rails or rail joints (for aligning rail ends to be welded 19a-29/46)
19a-31/10	. . Devices for pulling rails together and holding them while welding
19a-31/12	. . Removing metal from rails, rail joints, or baseplates, e.g. for deburring welds, reconditioning worn rails
19a-31/13	. . . by milling
19a-31/14	. . . Portable tools
19a-31/15	. . . by planing or filing
19a-31/16	. . . Transportable machines
19a-31/17	. . . by grinding
19a-31/18	. . Reconditioning or repairing worn or damaged parts on the spot, e.g. applying inlays, building-up rails by welding (19a-31/04-19a-31/12 take precedence); Heating or cooling of parts on the spot, e.g. for reducing joint gaps, for hardening rails
19a-31/20	. Working or treating non-metal sleepers in or on the line, e.g. marking, creosoting (working metal sleepers 19a-31/02)
19a-31/22	. . Cutting or grinding wooden sleepers, e.g. for forming rail seats (19a-31/24 takes precedence)
19a-31/23	. . . Sectioning (combined with removal of segments from track 19a-29/11)
19a-31/24	. . Forming, treating, reconditioning, or cleaning holes in sleepers; Drilling-templates (19a-29/28, 19a-31/26 take precedence)
19a-31/26	. . Inserting or removing inserts or fillings for holes in sleepers, e.g. plugs, sleeves
19a-31/28	. . Applying or removing anti-splitting or like reinforcing means (19a-31/26 takes precedence; straps or bands therefor 19a-3/08)
19a-33/00	Machines or devices for shifting tracks, with or without lifting, e.g. for aligning track, for shifting excavator track (combined with sleeper packing machines 19a-27/17)
19a-33/02	. for slewing, i.e. transversely shifting, in steps
19a-33/04	. . Manual tools; Devices not mounted on vehicles

- 19a-33/06 . for slewing in a continuous operation, e.g. for tracks which carry excavators
- 19a-33/08 . . Boom track-slewing machines
- 19a-33/10 . . Bridge track-slewing machines
- 19a-33/12 . . Combined boom and bridge track-slewing machines
- 19a-33/14 . . Machines for slewing portable tracks
- 19a-33/16 . . Machines for slewing track ends
- 19a-33/18 . . Details not peculiar to a particular type of machine
- 19a-33/20 . . . Details of lifting or pushing rollers
- 19a-33/21 . . . Arrangement or construction of rollers moving the rails
- 19a-33/22 . . . Construction of lifting or pushing rollers
- 19a-33/24 Devices for packing or levelling to be used with slewing machines

19a-35/00 Applications of measuring apparatus or devices for track-building purposes

- 19a-35/02 . for spacing; for cross levelling; for laying-out curves
- 19a-35/04 . . Wheeled apparatus
- 19a-35/06 . for measuring irregularities in longitudinal direction
- 19a-35/08 . . for levelling
- 19a-35/10 . . for aligning
- 19a-35/12 . for measuring movement of the track or of components thereof under rolling loads, e.g. depression of sleepers, increase of gauge

19a-37/00 Making, maintaining, renewing, or taking-up the ballastway or the track, not provided for in a single one of groups 19a-27/00-19a-35/00

19b Cleaning of roads and traffic areas, including playgrounds and playing fields

- Street cleaning machines (brushes for same 9b-2, 9b-6, 9b-7)
- 19b-1/01 General
- 19b-1/02 Automatic pickup
- 19b-1/03 Manual sweeping machines
- 19b-1/04 Sweeping machines with vertical sweeper shaft 10
- 19b-1/10 Street vacuum cleaners (34c-11/03)
- 19b-1/20 Street sweeping machines with refuse combustion
- 19b-3 Street washing and scraping machines, machines for loosening the street dirt
- Street sprinkling (19c-11/30; 19c-11/36)
- 19b-4/01 Sprinkler trucks (for tar, bitumen, etc. 19c-11/30, 19c-11/36)
- 19b-4/10 Stationary street-sprinkling devices Snow and ice removal
- 19b-6/01 Ice removal
- 19b-6/02 Snow removers (19c-10/10)
- 19b-6/03 Hand removers
- 19b-6/04 Snow melters
- 19b-7 Fog dispersal in general, e.g. on roads and airports (devices and processes for influencing weather conditions 45f-15/00; fog dispersal from air planes 62c-20/02; on ships 65a2-72; for purposes of defence or attack 72g-7/04)

19b (IPC: E01H) Street cleaning; Cleaning of permanent ways; Cleaning beaches; Dispersing fog in general

19b-1/00 Removing undesirable matter from roads or like surfaces, with or without moistening of the surface

- 19b-1/02 . Brushing apparatus (brushes per se 9b)
- 19b-1/04 . . taking-up the sweepings, e.g. for collecting, for loading
- 19b-1/05 . . with driven brushes (19b-1/04 takes precedence)
- 19b-1/06 . . Manually operated brushing machines
- 19b-1/08 . Pneumatically dislodging or taking-up undesirable matter (suction cleaners in general 34e-5/00 – 34e-9/00)

19b-1/10	. Hydraulically loosening or dislodging undesirable matter; Raking or scraping apparatus (brushing apparatus 19b-1/02)
19b-1/12	. Hand implements (brushes 9b)
19b-1/14	. Removing by magnetic effect
19b-3/00	Applying liquids to roads or like surfaces, e.g. for dust control; Stationary flushing devices
19b-3/02	. Watering-vehicles (applying liquid materials for road paving 19c-19/16)
19b-3/04	. Fixed devices, e.g. permanently-installed flushing means
19b-4/00	Compacting snow to provide surfaces suitable for traffic purposes (specially adapted for ski tracks 77b-19/10)
19b-5/00	Removing snow or ice from roads or like surfaces
19b-5/02	. Hand implements
19b-5/04	. Apparatus propelled by animal or engine power
19b-5/06	. . . dislodging essentially by non-driven elements, e.g. scraper blades
19b-5/07	. . . and conveying dislodged material by driven or pneumatic means
19b-5/08	. . . dislodging essentially by driven elements
19b-5/09	. . . the elements being rotary or moving along a closed circular path, e.g. rotary cutter, digging wheels
19b-5/10	. by application of heat
19b-5/12	. Apparatus or implements specially adapted for breaking, disintegrating, or loosening layers of ice or hard snow
19b-6/00	Apparatus equipped with, or having provisions for equipping with, both elements for removal of refuse or the like and elements for removal of snow or ice (19b-8/10 takes precedence)
19b-7/00	Methods and devices for removing snow and ice from railway tracks and tramway tracks
19b-7/02	. Snow ploughs, Snow planers
19b-7/04	. . detachably mounted on locomotives
19b-7/06	. . Motor-driven ploughs or planers
19b-7/08	. Snow removers with rotating or oscillating tools
19b-7/10	. by melting
19b-8/00	Removing undesirable matter from the permanent way of railways; Removing undesirable matter from tramway rails (19b-1/00 – 19b-6/00 take precedence)
19b-8/02	. Methods or apparatus for removing ice or snow from railway tracks, e.g. using snow-ploughs (operating only on rails or flange grooves 19b-8/10)
19b-8/04	. . essentially by non-driven elements
19b-8/06	. . essentially by driven tools
19b-8/08	. . by application of heat (heated track 19a-19/00)
19b-8/10	. Removing undesirable matter from rails, flange grooves, or the like, e.g. removing ice from contact rails, removing mud from flange grooves (heating, blowing, or fluid-applying devices installed in the track 19a-19/00; built-in draining devices for rails 19a-21/02; removing ballast from rails 19a-27/04)
19b-8/12	. . specially adapted to grooved rails, flangeways, or the like
19b-9/00	Tools for cleaning rails, particularly of tramways
19b-9/02	. Hand tools
19b-9/04	. by melting
19b-10/00	Improving gripping power of ice-bound or other slippery traffic surfaces, e.g. using gritting or thawing materials (roughening ice by means of tools 19b-5/12; applying de-icing agents to rails 19b-8/10; by constructional features 19c-11/24; de-icing compositions 22k-3/18)
19b-11/00	Control of undesirable vegetation on roads or permanent ways of railways (destruction of undesirable vegetation in general 45k); Applying liquids, e.g. water, weed-killer, bitumen, to permanent ways

19b-12/00	Cleaning beaches
19b-13/00	Dispersing fog in general, e.g. on roads, on airfields (influencing weather conditions 45f-15/00; dispersing fog from aircraft 62c-20/02; on ships 65a2-72; for defence or attack 72g-7/04)
19c	Paving of roads and traffic areas, playgrounds and playing fields
19c-1	Crushed-stone, gravel and similar street reinforcing materials
	Stone pavements (house pavements, heavy floorings 37d-5, 37d-6/01, 37d-6/02, 37d-7/01)
19c-2/01	General arrangement and form
19c-2/10	Natural stone pavements: large paving stones, small paving stones, large gravel
	Artificial stone pavements (80b-25/12)
19c-2/21	of clinker
19c-2/22	of stones with hydraulic binders
19c-2/23	of stones with bituminous binders
19c-2/24	of stones with other binders
	Cohesive brick paving cemented by hydraulic or other binders (80b-1/01 – 80b-6/09)
19c-2/31	with cement or lime as a binder
19c-2/32	with soluble glass, etc. as a binder
	Bitumen and tar pavements (80b-25/01 – 80b-25/16)
19c-3/01	Bitumen pavements: tamped, cast, rolled asphalt
19c-3/02	Bitumen gravel: mixing and impregnating processes, surface treatment
19c-3/10	Tar pavements, mixing and impregnating processes, surface treatment
	Mixed tar and bitumen pavement
19c-3/20	together or with other insoluble hydrocarbons
19c-3/21	with cement, rubber, caoutchouc, leather, fibre substances, etc.
19c-3/30	Pavements made from emulsions (23c-2)
19c-3/31	Pavements made from solutions
19c-3/40	Pavements made of cement and bitumen, fresh or freshly worked
19c-4	Wood pavements (37d-5)
19c-5/01	Iron pavements
19c-5/10	Rubber pavements
19c-5/20	Pavement made of special substances (80b)
19c-5/30	Trackways
19c-5/40	Playground paving (77a-25/01 – 77a-25/06; 77a-25/08; 77b-20)
19c-6/01	Gutters and kerbstones
19c-6/10	Joints (37b-3/01 – 37b-3/05, 37d-7/02)
19c-6/20	Reinforcements (37b-4/01; 37b-4/02)
19c-6/30	Traffic safety signs, built in, without own illumination (general 74d-8/50 – 74d-8/70)
19c-6/40	Sidewalks, light-transmitting blocks
19c-6/50	Special features against slipping, weathering, shocks, etc. (37f-7/11)
19c-7	Connection of pavements to rail tracks, also at crossings and pedestrian crossings
	Road rollers (19a-27/02; 19e-1; 45a-48)
19c-8/01	Hand rollers
19c-8/10	Mechanically driven rollers
	Pavement rams and stamping machines (50c-10; 80a-14/01 – 80a-14/25; 84c-4)
19c-9/01	Hand rams

19c-9/10	Power rams
19c-9/20	Finishing rams for concrete and bitumen roads
19c-10/01	Road breakers
19c-10/10	Road scrapers (19a-27/02; 19b-6/02; 19e-1; 84d-1/01 – 84d-1/06)
19c-10/20	Shovels
	Auxiliary tools and devices
19c-11/01	for mechanically laying macadam and block pavements (19a-27/02; 19a-27/03)
19c-11/10	Concrete mixers and spreaders for road construction (19a-27/02; 19a-27/03; 80a-7/01 – 80a-7/55)
19c-11/20	Machines for preparing materials for bitumen-gravel roads (19a-27/02; 19a-27/03; 80a-8)
19c-11/30	Bitumen melting pots (22h-8) and distributing trucks
19c-11/36	Bitumen nozzles, spreaders (45b-5; 61a-16/01 – 61a-16/04; 85g-3)
19c-11/40	Devices for heating, drying and temporarily protecting pavements
19c-11/50	Devices for making joints, for laying iron reinforcements, for roughening, smoothing, shaping, cutting, testing of pavements
19c-11/60	Road forming rails
19c-11/65	Devices for transporting road-building materials, gravel spreaders (45b-6/01; 45b-10 – 45b-19)
19c-11/70	Driers, stone crushers (50c)
19c-11/80	Devices for making lines on streets and playgrounds (77a-25/01 – 77a-25/04)
19c-12	Miscellaneous

19c (IPC: E01C) Construction of and surfaces for roads, sports grounds, or the like; Machines and auxiliary tools for construction and repair

19c-1/00	Design or layout of roads, e.g. for noise abatement, for gas absorption (design or layout of sports grounds 77b-19/00; design or layout of airfields 62c)
19c-1/02	. Crossings, junctions, or interconnections between roads on the same level
19c-1/04	. Road crossings on different levels; Interconnections between roads on different levels

Structure of roads, playgrounds, sports grounds, airfields

19c-3/00	Foundations for paving of roads or runways or airfields (foundations in general 84c)
19c-3/02	. Concrete base for bituminous paving
19c-3/04	. Foundations produced by soil stabilisation
19c-3/06	. Methods or arrangements for protecting foundations from destructive influences of moisture, frost or vibration
19c-5/00	Paving for roads or airfields made of prefabricated single units; Similar paving for playgrounds or sports grounds (building stones 37b; flooring 37d; making artificial stones 84b)
19c-5/02	. made of natural stones, e.g. sett stones
19c-5/04	. made of bricks
19c-5/06	. made of units with cement or like binders
19c-5/08	. . Reinforced units
19c-5/10	. . . Pre-stressed reinforced units
19c-5/12	. made of units with bituminous binders
19c-5/14	. made of wooden units
19c-5/16	. made of metallic units (steel gratings 19c-9/10)
19c-5/18	. made of rubber units
19c-5/20	. made of units of plastics (19c-5/18 takes precedence)
19c-5/22	. made of units composed of a mixture of materials covered by two or more of groups 19c-5/02-19c-5/20

19c-7/00	Coherent paving for roads or airfields made in situ; Similar paving for playgrounds or sports grounds
19c-7/02	. made of road-metal without binders
19c-7/04	. . of broken stones, gravel, or like materials
19c-7/06	. . by melting, burning, or vitrifying road-metal in situ
19c-7/08	. made of road-metal and binders
19c-7/10	. . of road-metal and cement or like binders (cement or like binders, composition of mortars 80b)
19c-7/12	. . . Mortar-bound paving
19c-7/14	. . . Concrete paving
19c-7/16	. . . . Pre-stressed concrete paving
19c-7/18	. . of road-metal and bituminous binders
19c-7/20	. . . Binder incorporated in cold state, e.g. natural asphalt
19c-7/22	. . . Binder incorporated in hot state, e.g. heated bitumen
19c-7/24	. . . Binder incorporated as an emulsion or solution (making dispersions or emulsions for road building 80b)
19c-7/26	. . . mixed with other materials, e.g. cement, rubber, leather, fibre
19c-7/28	. . . Topping or surface dressings; Methods of mixing, impregnating, or spreading them
19c-7/30	. . of courses of different kind made in situ
19c-7/32	. . . made of several courses which are not bound to each other
19c-7/34	. by subjecting soil to stabilisation
19c-7/35	. . Topping or surface dressings; Methods of mixing, impregnating, or spreading them
19c-7/36	. by subjecting soil to stabilisation
19c-9/00	Special pavings; Pavings for special parts of roads or airfields (pavement lights 19c-17/00; manhole or like covers or frames 84c)
19c-9/02	. Wheel tracks (rail tracks for guiding vehicles 19a-25/28)
19c-9/04	. Pavings for railroad level-crossings
19c-9/06	. Pavings adjacent tramways rails
19c-9/08	. Temporary pavings (steel gratings 19c-9/10)
19c-9/10	. Steel gratings (as building elements in general 37b; gully gratings 85c/10)
19c-11/00	Details of the paving for roads or airfields
19c-11/02	. Arrangement or construction of joints; Methods of making joints; Packing for joints
19c-11/04	. . for cement concrete paving
19c-11/06	. . . Methods of making joints
19c-11/08	. . . Packing of metal
19c-11/10	. . . Packing of plastic or elastic materials
19c-11/12	. . . Packing of metal and plastic or elastic materials
19c-11/14	. . . Dowel assembly
19c-11/16	. Reinforcements (for building in general 37b)
19c-11/18	. . for cement concrete pavings
19c-11/20	. . . for prestressed concrete pavings
19c-11/22	. Gutters; Kerbs
19c-11/24	. Methods or arrangements for preventing slipperiness or protecting against influences of the weather
19c-11/26	. . Permanently-installed heating or blowing devices
19c-13/00	Pavings or foundations specially adapted to playgrounds or sports grounds (general layout 77b-19/00)
19c-15/00	Pavements specially adapted to footpaths, sidewalks, or cycle tracks
19c-17/00	Pavement lights, i.e. translucent constructions forming part of the surface (blocks specially designed for marking roads 19e-9/04)

Machines, tools, or auxiliary devices for constructing or repairing the surfacing of roads or like structures

- 19c-19/00** **Machines, tools, or auxiliary devices for preparing or distributing paving materials, for working the placed materials, or for forming, consolidating, or finishing the paving** (preparation of concrete and similar masses in general 37a, 37e, 80a, 80b; transporting concrete in general 81e)
- 19c-19/02 . for preparing the materials
 - 19c-19/04 . Transportable rock crushers combined with other machines for preparing road-building material; Special devices for transporting road-building material
 - 19c-19/05 . . Crushing, pulverising, or disintegrating apparatus; Aggregate screening, cleaning, or heating apparatus
 - 19c-19/06 . . Concrete mixers combined with arrangements for distributing the mixed masses (concrete mixers in general 80a)
 - 19c-19/08 . . Apparatus for transporting and melting asphalt, bitumen, tar, or the like (stationarily-arranged melting boilers for tar, asphalt, or the like in general 22h-7/02)
 - 19c-19/10 . . Apparatus or plant for pre-mixing or precoating aggregate or fillers with bitumen
 - 19c-19/12 . for distributing granular or liquid materials
 - 19c-19/14 . . for distributing additional material or construction elements for paving (for sand or gravel 19c-19/20)
 - 19c-19/15 . . for laying-down uncoated stone or similar materials, or for striking-off or spreading same without compacting, e.g. for crushed rock base courses, sand cushions for paving (19c-19/52 takes precedence; distributing 19c-19/20)
 - 19c-19/16 . . for applying or spreading liquid materials, e.g. bitumen slurries (spraying or spreading liquids in general 85g)
 - 19c-19/17 . . . Application by spraying
 - 19c-19/18 . . Devices for distributing road-metals mixed with binders, e.g. cement, bitumen, without consolidating or ironing effect (conveying installations for concrete or the like 81e)
 - 19c-19/20 . . Apparatus for distributing, e.g. spreading, granular or pulverulent materials, e.g. sand, gravel, salt, dry binders
 - 19c-19/21 . . for simultaneously but separately applying liquid material and granular or pulverulent material, e.g. bitumen and grit, with or without spreading
 - 19c-19/22 . for consolidating or finishing laid-down unset materials
 - 19c-19/24 . . Hand rollers
 - 19c-19/26 . . Mechanically driven rollers
 - 19c-19/28 . . Rollers which apply a rolling pressure less than its weight; Vibrating rollers
 - 19c-19/23 . . Rollers (19c-19/43 takes precedence; specially adapted for compacting snow 19b-4/00; for compacting soil 84c-3/04; specially adapted for agricultural purposes 45a-29/00; garden rollers 45f-1/12)
 - 19c-19/24 . . . hand propelled
 - 19c-19/25 . . . propelled by animals or vehicles
 - 19c-19/26 . . . self-propelled or fitted to road vehicles
 - 19c-19/27 . . . with elastically-deformable rolling elements, e.g. pneumatic tyres (vibrating or impacting 19c-19/28)
 - 19c-19/28 . . Rollers which apply a rolling pressure less than its weight; Vibrating rollers
 - 19c-19/29 . . . Rolling apparatus adapted to apply a rolling pressure less than its weight, e.g. roller finishers travelling on formrails
 - 19c-19/30 . . Tamping or vibrating apparatus other than rollers (for working cement or clay 80a; tamping or vibrating soil in general 84c)
 - 19c-19/32 . . . Hand-held hand-actuated rammers or tampers
 - 19c-19/34 . . . Power-driven rammers or tampers
 - 19c-19/35 Hand-held or hand-guided tools (19c-19/36-19c-19/40 take precedence)
 - 19c-19/36 with direct-acting explosion chambers
 - 19c-19/38 with means specifically for generating vibrations
 - 19c-19/40 adapted to impart a smooth finish to the paving, e.g. tamping or vibrating finishers
 - 19c-19/41 . . Apparatus having both rolling tools and ramming, tamping, or vibrating tools
 - 19c-19/42 . . Machines only intended for working the surface of freshly-laid paving courses

- 19c-19/43 . . Machines or arrangements for roughening or patterning freshly-laid paving courses, e.g. indenting rollers
- 19c-19/44 . . Hand-actuated tools only intended for working the surface of freshly-laid paving courses
- 19c-19/45 . Portable apparatus for preparing, or for preparing and applying to the road, compound liquid binders, e.g. emulsified bitumen, fluxed asphalt (applying only 19c-19/16)
- 19c-19/46 . for preparing and placing the materials (except concrete 19c-19/06)
- 19c-19/47 . . Hydraulic cement concrete mixers combined with distributing means specially adapted for road building (concrete mixers per se 80a)
- 19c-19/48 . for laying-down the materials and consolidating them, or finishing the surface
- 19c-19/50 . Removable forms or shutterings for road-building purposes (19c-23/02, 19c-23/04 take precedence; permanent forms 19c-3/00-19c-7/00; slip forms 19c-19/48); Devices or arrangements for forming individual paving elements, e.g. kerbs, in situ
- 19c-19/52 . Apparatus for laying individual preformed surface elements, e.g. kerbs (preforming and placing continuous strip 19c-19/46; forming paving elements in situ 19c-19/50)
- 19c-21/00 Apparatus or processes for surface stabilisation for road building or like purposes, e.g. mixing borrowed aggregate with binder (soil stabilisation in general 84c)**
- 19c-21/02 . Fusing, calcining, or burning soil in situ
- 19c-23/00 Auxiliary devices or arrangements for constructing, repairing, reconditioning, or taking-up road or like surfaces (road graders or scrapers 84c)**
- 19c-23/01 . Devices or auxiliary means for setting-out or checking the configuration of new surfacing, e.g. templates, screed supports (form rails 19c-19/50); Applications of apparatus for measuring, indicating, or recording the surface configuration of existing surfacing, e.g. profilographs (19c-23/07 takes precedence)
- 19c-23/02 . Devices for making, treating, or filling joints, e.g. flexible joints
- 19c-23/03 . Arrangements for curing paving; Devices for applying curing means; Devices for laying prefabricated underlay, e.g. sheets, membranes (reinforcing elements 19c-23/04); Protecting paving under construction or while curing, e.g. use of tents (road barriers 19e-13/00)
- 19c-23/04 . Devices for laying reinforcing elements or dowel bars (tongs 87a)
- 19c-23/05 . Devices for installing or removing forms
- 19c-23/06 . Devices or arrangements for working the finished surface (working freshly-laid paving 19c-19/42); Devices for repairing the surface of damaged paving
- 19c-23/07 . . Apparatus combining measurement of the surface configuration of paving with application of material in proportion to the measured irregularities (measuring means only 19c-23/01)
- 19c-23/08 . . for roughening or patterning; for removing high spots or material bonded to the surface, e.g. markings (working stone 80d; machines for testing paving 42k)
- 19c-23/09 . . for forming cuts, grooves, or recesses, e.g. for making joints or channels for markings, for cutting-out sections to be removed; for cleaning, treating, or filling cuts, grooves, recesses, or fissures; for trimming paving edges
- 19c-23/10 . . for raising or levelling sunken paving
- 19c-23/12 . . for taking-up, tearing-up, or breaking-up paving (breaking-up ground 84d-5/30)
- 19c-23/14 . for heating or drying foundation or paving
- 19c-23/16 . Devices for marking-out, applying, or forming traffic or like markings on finished paving (marking-out playing courts or playgrounds 77b-19/06)

19d Bridge construction, e.g. assembling scaffolds

Bridges of stone, reinforced or unreinforced concrete

19d-1/01 Load-carrying structure and paving (girders 37b-3)

19d-1/03 Pre-stressed reinforced-concrete bridges (girders 37b-3)

19d-2 Wooden bridges

	Iron bridges
19d-3/01	Load-carrying structure (girders 37b-3)
19d-3/02	Paving
19d-4/01	Suspension bridges
19d-4/05	Suspended ferry bridges
	Movable bridges
19d-5/01	Lift bridges
19d-5/02	Swing bridges
19d-5/03	Bascule bridges
19d-5/04	Draw bridges
19d-5/05	Roll bridges
19d-6/01	Mobile bridges, portable bridges, and bridges for military use apart from pontoon bridges (19d-6/05)
19d-6/05	Floating bridges, pontoon bridges and landing bridges (floats and pontoons 65a1-8)
	General structural elements used in bridge construction
19d-7	Scaffolds for bridge construction, centrings (scaffolds for building engineering 37e) lowering and lifting devices, assembling methods
19d-8	Piers and abutments for bridges (foundations 84c)
19d-9	Bearings and pivots
19d-10	Covering of expansion joints
19d-11	Insulation and draining devices
19d-12	Railings, smoke protection devices, inspection cars
19d	Bridges and bridge construction, also canal bridges, inclusive of centring and assembling scaffolds
19d-1	General arrangement and design of bridge structures, independently of the structural materials or the kind of bridge
	Stationary bridges
19d-2	Stone bridges and bridges of rammed concrete
19d-3	Wooden bridges (suspension bridges 19d-7/01)
	Reinforced-concrete bridges (suspension bridges 19d-7/01)
19d-4/01	General arrangement and design of reinforced concrete bridges (girders 37b-3)
19d-4/05	Pre-stressed reinforced-concrete bridges (girders 37b-3)
	Metal bridges (suspension bridges 19d-7/01; girders 37b-3)
19d-5/01	General design and arrangement of metal bridges
19d-5/05	Steel bridges
19d-5/10	Compound-structure bridges
19d-5/15	Light metal and other metal bridges
	Suspension bridges and suspended ferry bridges
19d-7/01	Suspension bridges
19d-7/10	Suspended ferry bridges
	Movable and portable bridges
19d-8/01	General
19d-8/05	Lift bridges
19d-8/10	Swing bridges
19d-8/15	Bascule bridges
19d-8/20	Draw bridges
19d-8/25	Roll bridges, rotary bridges, displaceable bridges
19d-8/30	Mobile bridges, portable bridges, and bridges for military use apart from pontoon bridges

19d-8/40	Floating bridges, pontoon bridges and landing bridges (floats and pontoons 65a1-8)
	General equipment and structural elements used in bridge construction
19d-10	Scaffolds for bridge construction, centrings (scaffolds for building engineering 37e) lowering and lifting devices, assembling methods
19d-11	Piers and abutments for bridges (foundations 84c)
19d-12	Bearings and pivots
19d-13	Arrangement, structure and covering of expansion joints
19d-14	Insulation (37a-7; 37b-6) and draining devices
19d-15	Railings, smoke protection devices, inspection cars
19d-16	Devices and equipment for calculating bridge structures
19d-17	Bridge covering and roadway structure crosstie fastening in railway bridges (19a)

19d	(IPC: E01D) Construction of bridges or viaducts; assembly of bridges
19d-1/00	General arrangement or construction of bridges
19d-3/00	Stone or brick bridges
19d-5/00	Wooden bridges (19d-11/00 – 19d-17/00 take precedence)
19d-7/00	Bridges of reinforced concrete (19d-11/00 – 19d-17/00 take precedence)
19d-7/02	. Bridges of pre-stressed concrete (girders 37b-3/01 – 37b-3/03)
19d-9/00	Metal bridges (19d-11/00 – 19d-17/00 take precedence; girders in general 37b-3/01 – 37b-3/03)
19d-9/02	. Details of construction
19d-9/04	. Pre-stressed
19d-9/06	. with parts subjected to compression made of concrete
19d-9/08	. made of non-ferrous metals, e.g. of light metals
19d-11/00	Suspension bridges
19d-13/00	Suspension ferries, i.e. transporter bridges
19d-15/00	Movable or portable bridges
19d-15/02	. Vertical lift bridges
19d-15/04	. Swing bridges
19d-15/06	. Bascule bridges; Roller bascule bridges, e.g. of Scherzer type
19d-15/08	. . Drawbridges
19d-15/10	. Travelling bridges; Sliding bridges; Rotary cylinder bridges, i.e. rotating about longitudinal axis to invert and raise the road
19d-15/12	. Portable or sectional bridges, e.g. for military purposes (floating bridges 19d-15/14)
19d-15/14	. Pontoon bridges; Floating bridges or landing bridges (floating bodies or pontoons 65a1-8)
19d-17/00	Bridges for supporting pipelines
19d-19/00	Constructional elements for bridges
19d-19/02	. Piers; Abutments (foundations 84c)
19d-19/04	. Bearings; Hinges
19d-19/06	. Arrangement, construction, or bridging of expansion joints
19d-19/08	. Damp-proof or other insulating layers; Drainage arrangements or devices
19d-19/10	. Railings; Protectors against smoke or gases, e.g. of locomotives; Maintenance travellers; Fastening of pipes or cables to bridges (hangers or supports for pipes or cables 47f)
19d-19/12	. Grating or flooring for bridges; Fastening railway sleepers or tracks to bridges (sleepers 19a-3/00)

19d-21/00	Appliances or equipment specially adapted for erecting bridges; Assembling methods
19d-21/02	. Supports or falseworks for bridges (frameworks for building construction 37e); Lifting or lowering arrangements
19d-21/04	. Assembling methods
19d-23/00	Models for studies or calculations of forces acting on bridges or parts thereof (methods or instruments for measuring 42b, 42k)

19e Substructure for streets and railways, including auxiliary installations

19e-1	Processes for excavating, clearing and fixing earth and rocks for street and railway substructures (excavators 84d-1/01 – 84d-1/03; disposal and hauling installations 81e-126, 81e-128; road-rollers, rams, road scrapers and road breaking devices 19c-8/01 – 19c-10/20; reinforcing the building ground 84c-1, 84c-6; coastal and river-bank consolidation, dykes, dams, canals 84a-2 – 84a-5/03), making railway and road ditches (devices for ditch cutting 84d-1/01 – 84d-2; 45a-20/01 – 45a-20/03), driving of mine tunnels for military purposes
19e-2	Retaining and revetment walls for road and railway substructures (coast and river-bank consolidation 84a-2; harbour construction 84a-5/01)
19e-3	Signs for street and railway substructures, kilometre and border stones, way and elevation indicators (optical signals 74d-10/01 – 74d-10/04)
19e-4	Snow walls and fences for road and rail systems (fences 37d-36/01 – 37d-36/03; street curbs 19c-6/01)
19e-5	Railway platforms without operating devices, ditches and culverts (general arrangement of railway platforms 20a-1; bridges 19d)

19e (IPC: E01F) Additional work, such as equipping roads or the construction of platforms, helicopter landing stages, signs, snow fences, etc.

Arrangement or construction of additional equipment for roads or railways; Landing stages for helicopters

19e-1/00	Construction of platforms or refuge islands (general arrangement of railway platforms 20a)
19e-3/00	Landing stages for helicopters, e.g. located above buildings (lay-out of airfields 62c; buildings or like structures for special purposes 37f)
19e-5/00	Draining the sub-base of roads or ballastway of railways by trenches, culverts, or conduits (underground drainage 84c; conduits for sewerage 85e)
19e-7/00	Devices affording protection against snow, sand drifts, etc.; Anti-dazzle arrangements
19e-7/02	. Snow fences (fences in general 37d)
19e-7/04	. Devices affording protection against snowslides or avalanches
19e-7/06	. Anti-dazzle arrangements

Equipment for facilitating the use of roads

19e-9/00	Road signs or traffic signals (means for rendering conspicuous 54h)
19e-9/01	. Supports for road signs or signals, e.g. posts (poles per se 37f-12/00)
19e-9/02	. Marking or boundary stones (boundary stones for surveying 42c)
19e-9/04	. Road surface marking
19e-9/06	. . Traffic studs; Marking blocks
19e-9/08	. . Traffic lines
19e-9/10	. Traffic signals above the road surface, if the type of signalling is not of interest (acoustic or optic signalling 74d)

19e-11/00	Embedding pads or other sensitive devices in paving or other road surfaces
19e-13/00	Road barricades, traffic gates, etc. obstructing passage of vehicles or pedestrians (for railway crossings 20i)
19e-15/00	Safety guard fences keeping vehicles on the road (fences in general 37d); Road bollards

19f Tunnel construction

19f-1	Tunnel construction in road and railway building, canal tunnels, (underwater tunnels, open-pit tunnel construction and underground railway tunnels 84c-5; digging of pits 5c-1/01, 5c-1/20, 5c-1/30, 5c-2, 5c-8), structural design of tunnel linings, tunnel sealing and waterproofing, fixed and mobile tunnel lining scaffolds, tunnel ventilation, petrification processes in tunnel construction (mine ventilation 5d-3- 5d-5; blower equipment 27c-1 – 27c-16; processes for the manufacture of chemical petrification substances 84c-6; petrification procedures in mining 5c-1/30; for foundations 84c-6)
19f-2	Shield driving
19f-3	Tunnel drilling machines with devices for breaking rock (rock-drilling machines 5b-1 – 5b-8/30; pneumatic hammer drills 5b-9/01 – 5b-14/30)
19f-4	Chutes and conveying devices, blasting stages (conveying 5d-10 – 5d-14/10)

19f (IPC: E01G) Building of tunnels

19f-1/00	Layout and general configuration of tunnels, galleries etc. (pressure pipelines 84a)
19f-3/00	Methods and apparatus for construction of tunnels, galleries etc., with or without linings (for mining 5e, foundations 84c; submarine constructions 84e-29/06)
19f-3/02	. using a driving shield
19f-3/03	. . with boring or cutting means
19f-3/04	. using boring or cutting machines (boring or cutting machines for mining 5b)
19f-3/06	. Devices for removing or hauling away excavated material or spoil; Working or loading platforms (underground transport 5d-10/01 – 5d-13)
19f-3/08	. in open shafts (sinking and refilling of shafts 84c)
19f-3/10	. using pre-constructed sections that are assembled under water or sunk into water
19f-5/00	Methods, apparatus and elements for lining tunnels
19f-5/02	. Constructive features of linings; Construction methods
19f-5/04	. . Linings made of stones or preformed concrete slabs
19f-5/06	. . Metal linings
19f-5/08	. . Linings made of concrete cast in situ
19f-5/10	. . Waterproofing; Heat insulating (of pipes in general 47f); Soundproofing
19f-5/12	. Tools or machines for making linings
19f-5/14	. . for handling or placing units of linings
19f-5/16	. . for making linings made of concrete cast in situ (forms in general 37e)
19f-7/00	Arrangement and constructive features of equipment for tunnels
19f-7/02	. Ventilation of tunnels (ventilation of mines 5d-1 – 5d-5/10)
19f-7/04	. Draining of tunnels (draining of mines 5d-17)