

International Patent Classification

2011.01

Section E

FIXED CONSTRUCTIONS



World Intellectual Property Organization

SECTION E — FIXED CONSTRUCTIONS

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BUILDING

E01 CONSTRUCTION OF ROADS, RAILWAYS, OR BRIDGES

E01B PERMANENT WAY; PERMANENT-WAY TOOLS; MACHINES FOR MAKING RAILWAYS OF ALL KINDS (derailing or rerailing blocks on track, track brakes or retarders B61K; removal of foreign matter from the permanent way, vegetation control, applying liquids E01H)

Subclass index

STRUCTURE OF THE PERMANENT WAY

General structure.....	2/00
Ballastway, transverse or longitudinal sleepers.....	1/00, 3/00
Rails or switches for general application.....	5/00-13/00, 26/00
Rails or switches for particular application.....	21/00-26/00
Protective arrangements.....	15/00-19/00
MAKING, MAINTAINING, RENEWING, OR TAKING-UP THE BALLASTWAY OR THE TRACK.....	27/00-37/00

Structure of the permanent way for railways or tramways

- 1/00 Ballastway; Other means for supporting the sleepers or the track; Drainage of the ballastway** (draining by trenches, culverts, or conduits E01F 5/00)
- 2/00 General structure of permanent way** (railway networks B61B 1/00; foundations for pavings E01C 3/00; foundations in general E02D)
- 3/00 Transverse or longitudinal sleepers** (for switches or crossings E01B 7/22); **Other means resting directly on the ballastway for supporting rails**
- 3/02 • made from wood (drying or impregnating B27K)
- 3/04 • • Means for preventing cleaving
- 3/06 • • • Anti-cracking dogs
- 3/08 • • • Straps or bands for hooping or encircling sleepers (apparatus for hooping wooden railway sleepers on the spot E01B 31/28)
- 3/10 • • Composite sleepers
- 3/12 • • Longitudinal sleepers; Longitudinal sleepers integral or combined with tie-rods; Combined longitudinal and transverse sleepers
- 3/14 • • Slabs; Blocks; Fastening tie-rods to them
- 3/16 • made from steel
- 3/18 • • Composite sleepers
- 3/20 • • Sleeper construction for special purposes, e.g. with openings for ballast working (sleepers for shiftable track for heavy loads E01B 23/12)
- 3/22 • • Longitudinal sleepers; Longitudinal sleepers integral or combined with tie-rods; Combined longitudinal and transverse sleepers
- 3/24 • • Slabs; Blocks; Pot sleepers; Fastening tie-rods to them
- 3/26 • • combined with inserts of wood, artificial stone, or other material
- 3/28 • made from concrete or from natural or artificial stone (manufacture B28)
- 3/30 • • Hollow sleepers
- 3/32 • • with armouring or reinforcement (hollow sleepers E01B 3/30)

- 3/34 • • • with pre-tensioned armouring or reinforcement (pre-tensioned armouring or reinforcing elements E04C 5/00)
- 3/36 • • Composite sleepers
- 3/38 • • Longitudinal sleepers; Longitudinal sleepers integral or combined with tie-rods; Combined longitudinal and transverse sleepers; Layers of concrete supporting both rails
- 3/40 • • Slabs; Blocks; Pot sleepers; Fastening tie-rods to them
- 3/42 • • combined with inserts of wood or other material
- 3/44 • made from other materials only if the material is essential
- 3/46 • made from different materials (E01B 3/26, E01B 3/42 take precedence)
- 3/48 • Distance keepers or tie-rods for sleepers
- 5/00 Rails; Guard rails** (manufacture of rails B21B); **Distance-keeping means for them**
- 5/02 • Rails
- 5/04 • • Grooved rails
- 5/06 • • Reversible or invertible rails
- 5/08 • • Composite rails; Compound rails with dismountable or non-dismountable parts
- 5/10 • • • Composite grooved rails; Inserts for grooved rails
- 5/12 • • Rails with a foot serving as a sleeper
- 5/14 • • Rails for special parts of the track, e.g. for curves
- 5/16 • Distance keepers
- 5/18 • Guard rails; Connecting, fastening or adjusting means therefor
- 7/00 Switches; Crossings** (operating mechanisms B61L)
- 7/02 • Tongues; Associated constructions
- 7/04 • • Constructions with tongues turning about a vertical pivot at the end
- 7/06 • • Constructions with flexible tongues or flexible fishplates

- 7/08 • • Other constructions of tongues, e.g. tilting about an axis parallel to the rail, movable tongue blocks or rails
- 7/10 • Frogs
- 7/12 • • Fixed frogs made of one part or composite
- 7/14 • • with movable parts
- 7/16 • • Jump-over frogs
- 7/18 • Combinations of switches and crossings
- 7/20 • Safety means for switches, e.g. switch point protectors, auxiliary or guiding rail members
- 7/22 • Special sleepers for switches or crossings; Fastening means therefor
- 7/24 • Heating of switches
- 7/26 • Lubricating of switches (lubricating of rails B61K 3/00)
- 7/28 • Crossings
- 7/30 • • Jump-over crossings
- 9/00 Fastening rails on sleepers, or the like** (fastening rails to bridges E01D 19/12)
- 9/02 • Fastening rails, tie-plates, or chairs directly on sleepers or foundations; Means therefor
- 9/04 • • Fastening on wooden or concrete sleepers or on masonry without clamp members
- 9/06 • • • Railways spikes (nails in general F16B)
- 9/08 • • • Elastic spikes
- 9/10 • • • Screws or bolts for sleepers (screws or bolts in general F16B)
- 9/12 • • • Retaining or locking devices for spikes or screws
- 9/14 • • • Plugs, sleeves, thread linings, or other inserts for holes in sleepers (inserting plugs or sleeves E01B 31/26)
- 9/16 • • • • for wooden sleepers
- 9/18 • • • • for concrete sleepers
- 9/20 • • • by keys
- 9/22 • • Fastening on steel sleepers without clamp members
- 9/24 • • • by keys
- 9/26 • • • Welded fastenings
- 9/28 • • Fastening on wooden or concrete sleepers or on masonry with clamp members
- 9/30 • • • by resilient steel clips
- 9/32 • • Fastening on steel sleepers with clamp members
- 9/34 • • • by resilient steel clips
- 9/36 • • Metal sole-plates for rails which rails are directly fastened to sleepers
- 9/38 • Indirect fastening of rails by using tie-plates or chairs; Fastening of rails on the tie-plates or in the chairs
- 9/40 • • Tie-plates for flat-bottom rails (manufacture thereof B21)
- 9/42 • • • of two or more parts
- 9/44 • • Fastening the rail on the tie-plate
- 9/46 • • • by clamps
- 9/48 • • • • by resilient steel clips
- 9/50 • • • by keys
- 9/52 • • • • by resilient keys
- 9/54 • • Rail chairs
- 9/56 • • • for rails with two or more treads
- 9/58 • • Fastening the rail in the chair
- 9/60 • Rail fastenings making use of clamps or braces supporting the side or head of the rail
- 9/62 • Rail fastenings incorporating resilient supports
- 9/64 • Rail fastenings gripping or encircling the sleeper

- 9/66 • Rail fastenings allowing the adjustment of the position of the rails, so far as not covered by the preceding groups
- 9/68 • Pads or the like, e.g. of wood, rubber, placed under the rail, tie-plate, or chair
- 11/00 Rail joints** (electrical connection of rails B60M 5/00)
- 11/02 • Dismountable rail joints
- 11/04 • • Flat fishplates
- 11/06 • • • with keys or pins
- 11/08 • • Angle fishplates
- 11/10 • • Fishplates with parts supporting or surrounding the rail foot
- 11/12 • • Fishplates engaging only the rail foot
- 11/14 • • Rail foot flange clips in one piece
- 11/16 • • Fishplates for joining rails of different sections
- 11/18 • • Fishplates for temporarily repairing broken rails
- 11/20 • • with gap-bridging
- 11/22 • • • by parts of the rails
- 11/24 • • • • with oblique or overlapping rail ends
- 11/26 • • • • with interlocking rail ends
- 11/28 • • • by parts of the joining members
- 11/30 • • • • Fishplates with integral tread parts lying in the cross-section of the rail head
- 11/32 • • • by separate parts; Inserts bridging both rail heads
- 11/34 • • • • Auxiliary rail beside the gap
- 11/36 • • Fastening means for fishplates
- 11/38 • • • Locking arrangements for fastening means (locking means for nuts or bolts in general F16B)
- 11/40 • • Dismountable rail joints combined with welded parts
- 11/42 • Joint constructions for relatively movable rails, e.g. rails on turntables, traversers, or swing bridges
- 11/44 • Non-dismountable rail joints; Welded joints (welding methods B23K)
- 11/46 • • General methods for making gapless tracks
- 11/48 • • Joints made by flame welding
- 11/50 • • Joints made by electric welding
- 11/52 • • Joints made by alumino-thermal welding
- 11/54 • Electrically-insulating rail joints
- 11/56 • Special arrangements for supporting rail ends (foot supports E01B 11/08-E01B 11/14)
- 11/58 • • Bridge plates
- 11/60 • • • with wedges
- 11/62 • • Bridge chairs (chairs E01B 9/54-E01B 9/58)
- 13/00 Arrangements preventing shifting of the track**
- 13/02 • Rail anchors
- 15/00 Guards for preventing a person's foot being trapped in grooved rails**
- 17/00 Cattle guards connected to the permanent way** (grids in general for preventing cattle from straying A01K 3/00)
- 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 E01F 7/02; snow-ploughs E01H 8/02; watering E01H 11/00)
- 21/00 Track superstructure specially adapted for tramways in paved streets** (paving E01C 9/04, E01C 9/06)
- 21/02 • Special supporting means; Draining of rails

- 21/04 • Special fastenings, joint constructions, or tie-rods
- 23/00 Easily dismantlable or movable tracks, e.g. temporary railways; Details specially adapted therefor**
- 23/02 • Tracks for light railways, e.g. for field, colliery, or mine use
- 23/04 • • Fastening or joining means
- 23/06 • • Switches (turntables B60S, B61J); Portable switches; Turnouts
- 23/08 • Temporary tracks for use while repairing tramways
- 23/10 • Shiftable tracks for heavy loads, e.g. carrying excavators
- 23/12 • • Sleepers
- 23/14 • • Fastening or joining means (fastening of rails by keys E01B 9/24)
- 23/16 • • Switches
- 25/00 Tracks for special kinds of railways (systems B61B; wheel tracks on roads E01C 9/02)**
- Note(s)**
- In this group, the following term is used with the meaning indicated:
- "track" includes non-load-carrying guide rails.
- 25/02 • Tracks for rack railways
- 25/04 • • Rack rails; Supports or connections for rack rails
- 25/06 • • Switches; Frogs; Crossings
- 25/08 • Tracks for mono-rails with centre of gravity of vehicle above the load-bearing rail (E01B 25/30 takes precedence) [1, 7]
- 25/10 • • Mono-rails; Auxiliary balancing rails; Supports or connections for rails
- 25/12 • • Switches; Crossings
- 25/14 • Tracks for cable-drawn railway vehicles
- 25/15 • • Switches; Crossings
- 25/16 • Tracks for aerial rope railways with a stationary rope
- 25/18 • • Ropes; Supports, fastening or straining means for ropes (ropes in general D07B; masts E04H 12/00; rope sockets F16G)
- 25/20 • • Switches; Crossings
- 25/22 • Tracks for railways with the vehicle suspended from rigid supporting rails
- 25/24 • • Supporting rails; Auxiliary balancing rails; Supports or connections for rails
- 25/26 • • Switches; Crossings
- 25/28 • Rail tracks for guiding vehicles when running on road or similar surface (wheel tracks on roads E01C 9/02)
- 25/30 • Tracks for magnetic suspension or levitation vehicles [7]
- 25/32 • • Stators, guide rails or slide rails [7]
- 25/34 • • Switches; Frogs; Crossings [7]
- 26/00 Tracks or track components not covered by any one of main groups E01B 1/00-E01B 25/00**
- Making, maintaining, renewing, or taking-up the ballastway or the track; Tools or machines specially designed therefor**
- 27/00 Placing, renewing, working, cleaning, or taking-up the ballast, with or without concurrent work on the track; Devices therefor; Packing sleepers**
- 27/02 • Placing the ballast; Making the ballastway; Redistributing ballasting material; Machines or devices therefor; Levelling means
- 27/04 • Removing the ballast; Machines therefor, whether or not additionally adapted for taking-up ballast (E01B 27/06, E01B 27/12 take precedence; redistributing ballasting material E01B 27/02)
- 27/06 • Renewing or cleaning the ballast *in situ*, with or without concurrent work on the track
- 27/08 • • the track having been taken-up (E01B 27/11 takes precedence)
- 27/10 • • without taking-up the track (E01B 27/11 takes precedence)
- 27/11 • • combined with concurrent renewal of track components
- 27/12 • Packing sleepers, with or without concurrent work on the track; Compacting track-carrying ballast
- 27/13 • • Packing sleepers, with or without concurrent work on the track (preforming ballast cores or seats for sleepers E01B 27/02)
- 27/14 • • • Manual tools or hand-held power tools therefor
- 27/16 • • • Machines therefor, e.g. so-called sleeper-tamping machines
- 27/17 • • • • combined with means for lifting, levelling, or slewing the track
- 27/18 • • • by introducing additional fresh material under the sleepers, e.g. by the measured-shovel method, by the blowing method
- 27/20 • • Compacting the material of the track-carrying ballastway, e.g. by vibrating the track, by surface vibrators (of trackless ballastway E01B 27/02; for packing sleepers E01B 27/12)
- 29/00 Laying, rebuilding, or taking-up tracks; Tools or machines therefor (E01B 27/00, E01B 31/00 take precedence)**
- 29/02 • Transporting, laying, removing, or renewing lengths of assembled track, assembled switches, or assembled crossings (E01B 29/04 takes precedence)
- 29/04 • Lifting or levelling of tracks (lifting devices in general B66F)
- 29/05 • Transporting, laying, removing, or renewing both rails and sleepers (as assembled units E01B 29/02)
- 29/06 • Transporting, laying, removing, or renewing sleepers (E01B 29/05 takes precedence; carrying devices B65G 7/12)
- 29/09 • • under, or from under, installed rails
- 29/10 • • • for inserting or removing sleepers
- 29/11 • • • • Removal involving destruction of the sleeper, e.g. the sectioning thereof
- 29/13 • • • for moving sleepers in a direction parallel to the rails, e.g. for spacing or aligning them (E01B 29/10 takes precedence)
- 29/14 • • • for lifting sleepers up to the rails (lifting devices in general B66F)
- 29/16 • Transporting, laying, removing, or replacing rails; Moving rails placed on sleepers in the track (E01B 29/05 takes precedence; moving or tilting heavy loads in general B65G 7/00)
- 29/17 • • Lengths of rails assembled into strings, e.g. welded together
- 29/20 • • Moving rails placed on installed sleepers in the plane of the track
- 29/22 • • Raising rails from sleepers, e.g. for inserting sole-plates (lifting devices in general B66F)
- 29/24 • Fixing or removing detachable fastening means or accessories thereof; Pre-assembling track components by detachable fastening means (E01B 29/02, E01B 31/26 take precedence)

E01B

- 29/26 • • the fastening means being spikes (E01B 29/16 takes precedence; hand-held tools for nail or staple driving or extracting B25C)
- 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
- 29/29 • • • for horizontally-arranged fastening elements, e.g. fish-bolts
- 29/32 • Installing or removing track components, not covered by the preceding groups, e.g. sole-plates, rail anchors (E01B 31/26 takes precedence)
- 29/40 • Means or arrangements for temporarily supporting laid tracks, or rails or sleepers in the track (temporary fishplates E01B 11/18)
- 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 (E01B 31/26 takes precedence; independent heating means E01B 31/18; welding in general B23K; gluing metal parts in general F16B 11/00)
- 29/44 • • Methods for effecting joining of rails in the track, e.g. taking account of ambient temperature
- 29/46 • • Devices for holding, positioning, or urging together the rail ends (adjusting the joint by moving rails E01B 29/20)
- 31/00 Working rails, sleepers, baseplates, or the like, in or on the line; Machines, tools, or auxiliary devices specially designed therefor** (characterised by features independent of use on assembled track B21, B23-B25, B27)
- 31/02 • Working rail or other metal track components on the spot
- 31/04 • • Sectioning or slitting, e.g. by sawing, shearing, flame-cutting
- 31/06 • • Making holes, e.g. by drilling, punching, flame-cutting
- 31/08 • • Bending, e.g. for straightening rails or rail joints (for aligning rail ends to be welded E01B 29/46)
- 31/12 • • Removing metal from rails, rail joints, or baseplates, e.g. for deburring welds, reconditioning worn rails
- 31/13 • • • by milling
- 31/15 • • • by planing or filing
- 31/17 • • • by grinding
- 31/18 • • Reconditioning or repairing worn or damaged parts on the spot, e.g. applying inlays, building-up rails by welding (E01B 31/04-E01B 31/12 take precedence); Heating or cooling of parts on the spot, e.g. for reducing joint gaps, for hardening rails
- 31/20 • Working or treating non-metal sleepers in or on the line, e.g. marking, creosoting (working metal sleepers E01B 31/02)
- 31/22 • • Cutting or grinding wooden sleepers, e.g. for forming rail seats (E01B 31/24 takes precedence)
- 31/23 • • • Sectioning (combined with removal of segments from track E01B 29/11)
- 31/24 • • Forming, treating, reconditioning, or cleaning holes in sleepers; Drilling-templates (E01B 29/28, E01B 31/26 take precedence)
- 31/26 • • Inserting or removing inserts or fillings for holes in sleepers, e.g. plugs, sleeves
- 31/28 • • Applying or removing anti-splitting or like reinforcing means (E01B 31/26 takes precedence; straps or bands therefor E01B 3/08)
- 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 E01B 27/17)
- 33/02 • for slewing, i.e. transversely shifting, in steps
- 33/04 • • Manual tools; Devices not mounted on vehicles
- 33/06 • for slewing in a continuous operation, e.g. for tracks which carry excavators
- 33/08 • • Boom track-slewing machines
- 33/10 • • Bridge track-slewing machines
- 33/12 • • Combined boom and bridge track-slewing machines
- 33/18 • • Details not peculiar to a particular type of machine
- 33/21 • • • Arrangement or construction of rollers moving the rails
- 35/00 Applications of measuring apparatus or devices for track-building purposes** (apparatus on locomotives or cars to indicate or record bad track sections B61K 9/00; measuring angles, linear dimensions, or irregularities in general G01B, G01C)
- 35/02 • for spacing; for cross levelling; for laying-out curves
- 35/04 • • Wheeled apparatus
- 35/06 • for measuring irregularities in longitudinal direction
- 35/08 • • for levelling
- 35/10 • • for aligning
- 35/12 • for measuring movement of the track or of components thereof under rolling loads, e.g. depression of sleepers, increase of gauge
- 37/00 Making, maintaining, renewing, or taking-up the ballastway or the track, not provided for in a single one of groups E01B 27/00-E01B 35/00**

E01C CONSTRUCTION OF, OR SURFACES FOR, ROADS, SPORTS GROUNDS, OR THE LIKE; MACHINES OR AUXILIARY TOOLS FOR CONSTRUCTION OR REPAIR (forming road or like surfaces by compacting or grading snow or ice E01H)

Subclass index

DESIGN; FOUNDATIONS.....	1/00, 3/00, 13/00
PAVING FOR ROADS, PLAYGROUNDS, OR THE LIKE	
Paving in general.....	5/00, 7/00
Special paving.....	9/00, 13/00, 15/00
Details.....	11/00, 17/00
CONSTRUCTION OR REPAIR OF ROADS, PLAYGROUNDS, OR THE LIKE.....	21/00, 19/00, 23/00

- 1/00 Design or layout of roads, e.g. for noise abatement, for gas absorption** (design or layout of sports grounds A63C 19/00; design or layout of airfields B64F)
- 1/02 • Crossings, junctions, or interconnections between roads on the same level
- 1/04 • Road crossings on different levels; Interconnections between roads on different levels

Structure of roads, playgrounds, sports grounds, airfields

- 3/00 Foundations for pavings** (specially adapted for playgrounds or sports grounds E01C 13/02; foundations in general E02D)
- 3/02 • Concrete base for bituminous paving
- 3/04 • Foundations produced by soil stabilisation
- 3/06 • Methods or arrangements for protecting foundations from destructive influences of moisture, frost or vibration
- 5/00 Pavings made of prefabricated single units** (specially adapted for playgrounds or sports grounds E01C 13/04, for footpaths, sidewalks or cycle tracks E01C 15/00; making artificial stones C04B; building stones E04C; flooring E04F)
- 5/02 • made of natural stones, e.g. sett stones
- 5/04 • made of bricks
- 5/06 • made of units with cement or like binders
- 5/08 • • Reinforced units
- 5/10 • • • Prestressed reinforced units
- 5/12 • made of units with bituminous binders
- 5/14 • made of wooden units
- 5/16 • made of metallic units (steel gratings E01C 9/10)
- 5/18 • made of rubber units
- 5/20 • made of units of plastics (E01C 5/18 takes precedence)
- 5/22 • made of units composed of a mixture of materials covered by two or more of groups E01C 5/02-E01C 5/20
- 7/00 Coherent pavings made in situ** (specially adapted for playgrounds or sports grounds E01C 13/06, for footpaths, sidewalks or cycle tracks E01C 15/00)
- 7/02 • made of road-metal without binders
- 7/04 • • of broken stones, gravel, or like materials
- 7/06 • • by melting, burning, or vitrifying road-metal in situ
- 7/08 • made of road-metal and binders
- 7/10 • • of road-metal and cement or like binders (cement or like binders, composition of mortars C04B)
- 7/12 • • • Mortar-bound paving
- 7/14 • • • Concrete paving
- 7/16 • • • • Prestressed concrete paving
- 7/18 • • of road-metal and bituminous binders
- 7/20 • • • Binder incorporated in cold state, e.g. natural asphalt
- 7/22 • • • Binder incorporated in hot state, e.g. heated bitumen
- 7/24 • • • Binder incorporated as an emulsion or solution (making dispersions or emulsions for road building C04B)
- 7/26 • • • mixed with other materials, e.g. cement, rubber, leather, fibre
- 7/30 • • of road-metal and other binders, e.g. synthetic material
- 7/32 • • of courses of different kind made in situ

- 7/34 • • • made of several courses which are not bound to each other
- 7/35 • • Topping or surface dressings; Methods of mixing, impregnating, or spreading them
- 7/36 • by subjecting soil to stabilisation

- 9/00 Special pavings** (specially adapted for playgrounds or sports grounds E01C 13/00, for footpaths, sidewalks or cycle tracks E01C 15/00); **Pavings for special parts of roads or airfields** (pavement lights E01C 17/00; manholes or like covers or frames E02D 29/14)
- 9/02 • Wheel tracks (rail tracks for guiding vehicles E01B 25/28)
- 9/04 • Pavings for railroad level-crossings
- 9/06 • Pavings adjacent tramways rails
- 9/08 • Temporary pavings (steel gratings E01C 9/10)
- 9/10 • Steel gratings (gully gratings E03F 5/06; as building elements in general E04C)

11/00 Details of pavings

- 11/02 • Arrangement or construction of joints; Methods of making joints; Packing for joints (sealing joints not restricted to road or airfield paving E04B 1/68)
- 11/04 • • for cement concrete paving
- 11/06 • • • Methods of making joints
- 11/08 • • • Packing of metal
- 11/10 • • • Packing of plastic or elastic materials
- 11/12 • • • Packing of metal and plastic or elastic materials
- 11/14 • • • Dowel assembly
- 11/16 • Reinforcements (for building in general E04C)
- 11/18 • • for cement concrete pavings
- 11/20 • • • for prestressed concrete pavings
- 11/22 • Gutters; Kerbs (kerbs specially adapted for informing road users E01F 9/053)
- 11/24 • Methods or arrangements for preventing slipperiness or protecting against influences of the weather
- 11/26 • • Permanently-installed heating or blowing devices

13/00 Pavings or foundations specially adapted for playgrounds or sports grounds (general layout A63C 19/00)

- 13/02 • Foundations, e.g. with drainage or heating arrangements [6]
- 13/04 • Pavings made of prefabricated single units (E01C 13/08, E01C 13/10 take precedence) [6]
- 13/06 • Pavings made in situ (E01C 13/08, E01C 13/10 take precedence) [6]
- 13/08 • Surfaces simulating grass [6]
- 13/10 • for artificial surfaces for outdoor or indoor practice of snow or ice sports (E01C 13/08 takes precedence; production of snow or ice for winter sports or similar recreational purposes F25C 3/00) [6]
- 13/12 • • for snow sports [6]

15/00 Pavings specially adapted for footpaths, sidewalks, or cycle tracks

17/00 Pavement lights, i.e. translucent constructions forming part of the surface (blocks specially designed for marking roads E01F 9/04)

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

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** (surface stabilisation E01C 21/00; apparatus specially adapted for reconditioning or repairing paving E01C 23/00)

- 19/02 • for preparing the materials
- 19/05 • • Crushing, pulverising, or disintegrating apparatus (in general B02C); Aggregate screening, cleaning, or heating apparatus
- 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 C10C 3/12)
- 19/10 • • Apparatus or plants for premixing or precoating aggregate or fillers with non-hydraulic binders, e.g. with bitumen, with resins; Apparatus for premixing non-hydraulic mixtures prior to placing or for reconditioning salvaged non-hydraulic compositions
- 19/12 • for distributing granular or liquid materials (E01C 23/07 takes precedence; for filling joints or grooves E01C 23/02, E01C 23/09)
- 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 (E01C 19/52 takes precedence; distributing E01C 19/20)
- 19/16 • • for applying or spreading liquid materials, e.g. bitumen slurries (E01C 19/45, E01C 23/02, E01C 23/03, E01C 23/16 take precedence; spraying or spreading liquids or other fluent materials to surfaces in general B05)
- 19/17 • • • Application by spraying
- 19/18 • • Devices for distributing road-metals mixed with binders, e.g. cement, bitumen, without consolidating or ironing effect (E01C 19/20, E01C 19/47 take precedence; conveying installations for concrete or the like B65G)
- 19/20 • • Apparatus for distributing, e.g. spreading, granular or pulverulent materials, e.g. sand, gravel, salt, dry binders (fertiliser distributors A01C 15/00)
- 19/21 • • for simultaneously but separately applying liquid material and granular or pulverulent material, e.g. bitumen and grit, with or without spreading
- 19/22 • for consolidating or finishing laid-down unset materials (E01C 23/02 takes precedence; apparatus for generating vibrations in general B06B)
- 19/23 • • Rollers therefor; Such rollers usable also for compacting soil (E01C 19/43 takes precedence; specially adapted for agricultural purposes A01B 29/00; garden rollers A01G 1/12; making or maintaining surfaces of snow or ice E01H 4/00; solely for soil compaction E02D 3/026)
- 19/24 • • • hand propelled (E01C 19/27-E01C 19/29 take precedence)
- 19/25 • • • propelled by animals or vehicles (E01C 19/26-E01C 19/29 take precedence)
- 19/26 • • • self-propelled or fitted to road vehicles (E01C 19/27-E01C 19/29 take precedence)
- 19/27 • • • with elastically-deformable rolling elements, e.g. pneumatic tyres (vibrating or impacting E01C 19/28)
- 19/28 • • • Vibrated rollers or rollers subjected to impacts, e.g. hammering blows (E01C 19/29 takes precedence)

- 19/29 • • • Rolling apparatus adapted to apply a rolling pressure less than its weight, e.g. roller finishers travelling on formrails
- 19/30 • • Tamping or vibrating apparatus other than rollers (E01C 23/02, E01C 23/04 take precedence; vibrated depositing devices E01C 19/12; tamping or vibrating rollers E01C 19/28; portable percussion tools in general B25D; tamping or vibrating soil in general E02D 3/046)
- 19/32 • • • Hand-held hand-actuated rammers or tampers
- 19/34 • • • Power-driven rammers or tampers
- 19/35 • • • • Hand-held or hand-guided tools (E01C 19/36-E01C 19/40 take precedence)
- 19/36 • • • • with direct-acting explosion chambers
- 19/38 • • • • with means specifically for generating vibrations
- 19/40 • • • • adapted to impart a smooth finish to the paving, e.g. tamping or vibrating finishers
- 19/41 • • Apparatus having both rolling tools and ramming, tamping, or vibrating tools
- 19/42 • • Machines for imparting a smooth finish to freshly-laid paving courses other than by rolling, tamping, or vibrating (for distributing only E01C 19/12)
- 19/43 • • Machines or arrangements for roughening or patterning freshly-laid paving courses, e.g. indenting rollers
- 19/44 • • Hand-actuated tools other than rollers, dampers, or vibrators, specially adapted for imparting a required surface finish to freshly-laid paving courses (E01C 19/43 takes precedence)
- 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 E01C 19/16)
- 19/46 • for preparing and placing the materials (E01C 19/45 takes precedence; making surfaces by mixing borrowed aggregate with binders E01C 21/00)
- 19/47 • • Hydraulic cement concrete mixers combined with distributing means specially adapted for road building (concrete mixers per se B28C)
- 19/48 • for laying-down the materials and consolidating them, or finishing the surface
- 19/50 • Removable forms or shutterings for road-building purposes (E01C 23/02, E01C 23/04 take precedence; permanent forms E01C 3/00-E01C 7/00; slip forms E01C 19/48); Devices or arrangements for forming individual paving elements, e.g. kerbs, in situ
- 19/52 • Apparatus for laying individual preformed surface elements, e.g. kerbs (preforming and placing continuous strip E01C 19/46; forming paving elements in situ E01C 19/50)

21/00 **Apparatus or processes for surface stabilisation for road building or like purposes, e.g. mixing borrowed aggregate with binder** (stabilising soil under existing surfacing E01C 23/10; soil-conditioning or soil-stabilising materials C09K 17/00; soil-consolidation in general E02D 3/12)

- 21/02 • Fusing, calcining, or burning soil in situ

23/00 **Auxiliary devices or arrangements for constructing, repairing, reconditioning, or taking-up road or like surfaces** (apparatus for reconditioning of salvaged non-hydraulic compositions E01C 19/10)

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|-------|---|--------|---|
| 23/01 | • Devices or auxiliary means for setting-out or checking the configuration of new surfacing, e.g. templates, screed supports (form rails E01C 19/50); Applications of apparatus for measuring, indicating, or recording the surface configuration of existing surfacing, e.g. profilographs (E01C 23/07 takes precedence; measuring roughness or irregularity in general G01B) | 23/08 | • • for roughening or patterning; for removing high spots or material bonded to the surface, e.g. markings (removing matter not bonded to the surface E01H 1/00; roughening or detaching ice E01H 5/12) |
| 23/02 | • Devices for making, treating, or filling grooves or like channels in not-yet-hardened paving, e.g. for joints or markings (surface patterning E01C 19/43); Removable forms therefor (non-removable forms E01C 11/02); Devices for introducing inserts or removable insert-supports in not-yet-hardened paving (E01C 23/04 takes precedence; non-removable insert supports E01C 11/02) | 23/082 | • • • using non-powered tools [6] |
| 23/03 | • Arrangements for curing paving; Devices for applying curing means; Devices for laying prefabricated underlay, e.g. sheets, membranes (reinforcing elements E01C 23/04); Protecting paving under construction or while curing, e.g. use of tents (road barriers E01F 13/00) | 23/085 | • • • using power-driven tools, e.g. vibratory tools [6] |
| 23/04 | • Devices for laying reinforcing elements or dowel bars; Removable supports for reinforcing elements (non-removable supports therefor E01C 11/16; side forms adapted to supporting reinforcement E01C 19/50); Devices, e.g. removable forms, for making essentially horizontal ducts in paving, e.g. for prestressed reinforcement | 23/088 | • • • Rotary tools, e.g. milling drums [6] |
| 23/05 | • Devices for installing or removing forms | 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 |
| 23/06 | • Devices or arrangements for working the finished surface (working freshly-laid paving E01C 19/42-E01C 19/44, E01C 23/02; mining picks E21C 35/18); Devices for repairing the surface of damaged paving [6] | 23/10 | • • for raising or levelling sunken paving; for filling voids under paving; for introducing material into substructure (consolidating soil in general E02D 3/12) |
| 23/07 | • • Apparatus combining measurement of the surface configuration of paving with application of material in proportion to the measured irregularities (measuring means only E01C 23/01) | 23/12 | • • for taking-up, tearing-up, or breaking-up paving (adapted to both placing and removing paving E01C 19/52) |
| | | 23/14 | • • for heating or drying foundation, paving, or materials thereon, e.g. paint (E01C 23/03 takes precedence; heating or drying devices incorporated in the paving E01C 11/26; surface stabilisation by fusing, calcining, or burning soil <i>in situ</i> E01C 21/02; for street cleaning E01H 1/08; melting snow or ice on surfacing E01H 5/10) |
| | | 23/16 | • Devices for marking-out, applying, or forming traffic or like markings on finished paving (E01C 23/14 takes precedence; inserting or forming in not-yet-hardened paving E01C 23/02, in recesses formed in fully-set paving E01C 23/09; marking-out playing courts or playgrounds A63C 19/06; applying liquids or other fluent materials to surfaces in general B05; road surface markings <i>per se</i> E01F 9/04); Protecting fresh markings |
| | | 23/18 | • • for applying prefabricated markings [6] |
| | | 23/20 | • • for forming markings <i>in situ</i> [6] |
| | | 23/22 | • • • by spraying [6] |
| | | 23/24 | • • • by pouring [6] |

E01D BRIDGES (bridges extending between terminal buildings and aircraft for embarking or disembarking passengers B64F 1/305)

Note(s)

In this subclass, it is desirable to add the indexing codes of group E01D 101/00.

Subclass index

BRIDGES IN GENERAL.....	1/00
BRIDGES CHARACTERISED BY THE CROSS-SECTION OF THEIR BEARING SPANNING STRUCTURE.....	2/00
BRIDGES CHARACTERISED BY THEIR STRUCTURAL TYPE.....	4/00-15/00
BRIDGES CHARACTERISED BY THEIR FUNCTION.....	18/00
DETAILS.....	19/00
ERECTING OR ASSEMBLING BRIDGES.....	21/00
REPAIRING OR STRENGTHENING EXISTING BRIDGES.....	22/00
DISMANTLING BRIDGES.....	24/00

1/00 Bridges in general (characterised by their structural type E01D 4/00-E01D 15/00) [6]

2/02 • of the I-girder type [6]

2/04 • of the box-girder type [6]

2/00 Bridges characterised by the cross-section of their bearing spanning structure [6]

4/00 Arch-type bridges [6]

E01D

6/00	Truss-type bridges [6]	19/04	• Bearings; Hinges
6/02	• of bowstring type [6]	19/06	• Arrangement, construction, or bridging of expansion joints
11/00	Suspension or cable-stayed bridges [6]	19/08	• Damp-proof or other insulating layers; Drainage arrangements or devices
11/02	• Suspension bridges [6]	19/10	• Railings; Protectors against smoke or gases, e.g. of locomotives; Maintenance travellers; Fastening of pipes or cables to bridges
11/04	• Cable-stayed bridges [6]	19/12	• Grating or flooring for bridges; Fastening railway sleepers or tracks to bridges
12/00	Bridges characterised by a combination of structures not covered as a whole by a single one of groups E01D 2/00-E01D 11/00 [6]	19/14	• Towers; Anchors; Saddle supports [6]
15/00	Movable or portable bridges (arrangement of ship-based outboard ramps or gangways B63B 27/14; loading ramps B65G 69/28); Floating bridges	19/16	• Suspension cables; Cable clamps for suspension cables [6]
15/02	• Vertical lift bridges	21/00	Methods or apparatus specially adapted for erecting or assembling bridges [6]
15/04	• Swing bridges	21/06	• by translational movement of the bridge or bridge sections [6]
15/06	• Bascule bridges; Roller bascule bridges, e.g. of Scherzer type	21/08	• by rotational movement of the bridge or bridge sections [6]
15/08	• Drawbridges	21/10	• Cantilevered erection [6]
15/10	• Travelling bridges; Sliding bridges; Rotary cylinder bridges, i.e. rotating about longitudinal axis to invert and raise the road	22/00	Methods or apparatus for repairing or strengthening existing bridges [6]
15/12	• Portable or sectional bridges (floating bridges E01D 15/14)	24/00	Methods or apparatus for dismantling bridges [2006.01]
15/127	• combined with ground-supported vehicles for the transport, handling or placing of such bridges or of sections thereof [6]	<u>Indexing scheme associated with groups E01D 1/00-E01D 22/00, relating to the material constitution of bridges. [6]</u>	
15/133	• built-up from readily separable standardised sections or elements, e.g. Bailey bridges (E01D 15/127 takes precedence) [6]	101/00	Material constitution of bridges [6]
15/14	• Floating bridges, e.g. pontoon bridges (landing bridges E01D 15/24; floating bodies or pontoons B63B) [6]	<hr/>	
15/20	• collapsible, expandable, inflatable or the like (E01D 15/22 takes precedence) [6]	101/10	• Wood [6]
15/22	• designed as, or mounted on, vehicles [6]	101/20	• Concrete, stone or stone-like material [6]
15/24	• Bridges or similar structures, based on land or on a fixed structure and designed to give access to ships or other floating structures [6]	101/22	• Masonry; Bricks [6]
18/00	Bridges specially adapted for particular applications or functions not provided for elsewhere, e.g. aqueducts, bridges for supporting pipe-lines [6]	101/24	• Concrete [6]
19/00	Details of bridges	101/26	• reinforced [6]
19/02	• Piers; Abutments (foundations E02D)	101/28	• prestressed [6]
		101/30	• Metal (E01D 101/26 takes precedence) [6]
		101/32	• prestressed [6]
		101/34	• non-ferrous, e.g. aluminium [6]
		101/40	• Plastics [6]
E01F	ADDITIONAL WORK, SUCH AS EQUIPPING ROADS OR THE CONSTRUCTION OF PLATFORMS, HELICOPTER LANDING STAGES, SIGNS, SNOW FENCES, OR THE LIKE		

Subclass index

ARRANGEMENTS FOR ROADS OR RAILWAYS.....	1/00, 5/00-8/00
ARRANGEMENTS FOR FACILITATING THE USE OF ROADS.....	9/00-15/00
LANDING STAGES FOR HELICOPTERS.....	3/00

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

1/00	Construction of platforms or refuge islands (general arrangement of railway platforms B61B)	3/00	Landing stages for helicopters, e.g. located above buildings (layout of airfields B64F; buildings or like structures for special purposes E04H)
		5/00	Draining the sub-base of roads or ballastway of railways by trenches, culverts, or conduits (underground drainage E02D; conduits for sewerage E03F)

- 7/00 Devices affording protection against snow, sand drifts, side-wind effects, snowslides, avalanches or falling rocks** (permanently installed heating or blowing devices for roads E01C 11/26); **Anti-dazzle arrangements**
- 7/02 • Snow fences or similar devices, e.g. devices affording protection against sand drifts or side-wind effects (fences in general E04H 17/00)
- 7/04 • Devices affording protection against snowslides, avalanches or falling rocks, e.g. avalanche preventing structures, galleries (securing of slopes E02D 17/20; roof snow-traps E04D 13/10)
- 7/06 • Anti-dazzle arrangements (E01F 8/00 takes precedence) [3]
- 8/00 Arrangements for absorbing or reflecting air transmitted noise from road or railway traffic** (ground installations for reducing aircraft noise B64F 1/26; general building constructions for absorbing or reflecting noise, noise absorption or reflection for buildings E04B 1/74) [3]
- 8/02 • specially adapted for sustaining vegetation or for accommodating plants (receptacles for cultivation of plants A01G 9/02; securing slopes or inclines E02D 17/20; retaining or protecting walls E02D 29/02) [6]

Arrangements for facilitating the use of roads

- 9/00 Arrangement of road signs or traffic signals** (signals, signalling systems G08; signs, attachment thereof to supports G09F); **Arrangements for enforcing caution, e.g. speed bumps** [6]
- 9/011 • Upright bodies, e.g. marker posts or bollards; Supports for road signs (posts or poles in general E04H 12/00; means for attaching signs to a supporting structure in general G09F 7/18) [6]
- 9/012 • • free-standing, e.g. traffic cones, foldable or inflatable devices [6]
- 9/013 • • intended to be readily removable, e.g. for insertion into road-stud sockets (E01F 9/012 takes precedence) [6]
- 9/014 • • Storing, transporting, placing or retrieving portable devices [6]
- 9/015 • • with reflectors, e.g. with means for keeping clean [6]
- 9/016 • • illuminated (for obstructing or restricting traffic E01F 13/00) [6]
- 9/017 • • self-righting after deflection or displacement [6]
- 9/018 • • specially adapted for breaking, disengaging, collapsing or permanent deformation upon deflection or displacement, e.g. upon vehicle impact [6]
- 9/019 • • extensible, collapsible or pivotable (E01F 9/017, E01F 9/018 take precedence) [6]
- 9/03 • • Arrangements for fastening signs or signals to safety barriers or the like [6]
- 9/04 • Road surface markings; Kerbs or road edgings, specially adapted for informing road users, e.g. illuminated (for redirecting vehicles E01F 15/00) [6]

- 9/047 • • specially adapted for audible or vibrational signalling, e.g. rumble strips, or for enforcing reduced speed, e.g. speed bumps [6]
- 9/053 • • Kerbs or road edgings, specially adapted for informing road users, e.g. illuminated [6]
- 9/06 • • Traffic studs; Marking blocks
- 9/07 • • • having deflectable or displaceable parts, with or without return to original position, e.g. flexible flaps [6]
- 9/08 • • Traffic lines
- 9/087 • • • Lane delineators for physically separating traffic lanes and discouraging but not preventing crossing [6]
- 9/093 • • • movable for repeated use at different locations [6]
- 11/00 Embedding pads or other sensitive devices in paving or other road surfaces** (pressure-sensitive elements G01L; traffic control systems G08G)
- 13/00 Arrangements for obstructing or restricting traffic, e.g. gates, barricades** (for railway crossings B61L)
- 13/02 • free-standing [6]
- 13/04 • movable to allow or prevent passage [6]
- 13/06 • • by swinging into open position about a horizontal axis parallel to the road direction, i.e. swinging gates [6]
- 13/08 • • by swinging into closed position about a transverse axis situated in the road surface, e.g. tiltable sections of the road surface, tiltable parking posts [6]
- 13/10 • Vehicle barriers specially adapted for allowing passage in one direction only [6]
- 13/12 • for forcibly arresting or disabling vehicles, e.g. spiked mats [6]
- 15/00 Safety arrangements for slowing, redirecting or stopping errant vehicles, e.g. guard posts or bollards; Arrangements for reducing damage to roadside structures due to vehicular impact** (arrangements for fastening signs or signals to safety barriers or the like E01F 9/03; for forcibly arresting vehicles E01F 13/00) [6]
- 15/02 • Continuous barriers extending along roads or between traffic lanes (crossable-lane separators E01F 9/087) [6]
- 15/04 • • essentially made of longitudinal beams or rigid strips (E01F 15/10, E01F 15/12 take precedence) [6]
- 15/06 • • essentially made of cables, nettings or the like (E01F 15/10, E01F 15/12 take precedence; protection against falling rocks E01F 7/04; arresting gear for aircraft B64F 1/02) [6]
- 15/08 • • essentially made of walls or wall-like elements (E01F 15/10, E01F 15/12 take precedence) [6]
- 15/10 • • portable, e.g. for temporary use [6]
- 15/12 • • and having means for providing occasional passage, e.g. for emergency vehicles [6]
- 15/14 • specially adapted for local protection, e.g. for bridge piers, for traffic islands [6]

E01H STREET CLEANING; CLEANING OF PERMANENT WAYS; CLEANING BEACHES; CLEANING LAND; DISPERSING FOG IN GENERAL (mowers convertible to apparatus for sweeping or cleaning lawns or other surfaces, e.g. to remove snow, or capable of sweeping or cleaning lawns or other surfaces A01D 42/06; cleaning in general B08B) [4]

Subclass index

STREET CLEANING.....	1/00, 3/00, 5/00, 6/00, 11/00
MAKING OR MAINTAINING SURFACES OF SNOW OR ICE; IMPROVING GRIPPING POWER.....	4/00, 10/00
CLEANING OF PERMANENT WAYS.....	8/00, 11/00
CLEANING BEACHES.....	12/00
OTHER CLEANING OF LAND.....	15/00
DISPERSING FOG.....	13/00

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- | | |
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| <p>1/00 Removing undesirable matter from roads or like surfaces, with or without moistening of the surface (for snow or ice E01H 5/00; cleaning tramway rails E01H 8/00; obstruction-removers on vehicles B60R 19/00; in combination with application of bitumen or the like E01C 19/16; in combination with application of traffic lines E01C 23/16)</p> <p>1/02 • Brushing apparatus (E01H 1/08-E01H 1/14 take precedence; brushes in general A46B)</p> <p>1/04 • • taking-up the sweepings, e.g. for collecting, for loading</p> <p>1/05 • • with driven brushes (E01H 1/04 takes precedence)</p> <p>1/08 • Pneumatically dislodging or taking-up undesirable matter (suction cleaners in general A47L 5/00-A47L 9/00); Drying by heat only, or by streams of gas (permanently-installed heating or blowing devices E01C 11/26; heating or drying for road building or repairing E01C 23/14); Cleaning by projecting abrasive particles (sand-blasting in general B24C)</p> <p>1/10 • Hydraulically loosening or dislodging undesirable matter (stationary flushing devices E01H 3/04); Raking or scraping apparatus (hand implements E01H 1/12)</p> <p>1/12 • Hand implements, e.g. litter pickers (rakes A01D 7/00)</p> <p>1/14 • Removing by magnetic effect</p> <p>3/00 Applying liquids to roads or like surfaces, e.g. for dust control; Stationary flushing devices (combined with removal of undesirable matter E01H 1/00; spray heads, other outlets B05B)</p> <p>3/02 • Mobile apparatus, e.g. watering-vehicles (vehicle features B60P 3/22; applying liquid materials for road paving E01C 19/16)</p> <p>3/04 • Fixed devices, e.g. permanently-installed flushing means (hydrants E03B 9/02)</p> <p>4/00 Working on surfaces of snow or ice in order to make them suitable for traffic or sporting purposes, e.g. by compacting snow (production of artificial snow F25C 3/04) [4]</p> <p>4/02 • for sporting purposes, e.g. preparation of ski trails (production of snow or ice for winter sports or similar recreational purposes F25C 3/00) [4]</p> <p>5/00 Removing snow or ice from roads or like surfaces; Grading or roughening snow or ice (by applying de-icing agents E01H 10/00; obstruction removers on vehicles B60R 19/00; sand, gravel or salt spreaders E01C 19/20) [4]</p> <p>5/02 • Hand implements (E01H 5/04, E01H 5/10, E01H 5/12 take precedence)</p> | <p>5/04 • Apparatus propelled by animal or engine power; Apparatus propelled by hand with driven dislodging or conveying elements, e.g. conveying pneumatically (E01H 5/10, E01H 5/12 take precedence)</p> <p>5/06 • • dislodging essentially by non-driven elements, e.g. scraper blades</p> <p>5/07 • • • and conveying dislodged material by driven or pneumatic means</p> <p>5/08 • • dislodging essentially by driven elements</p> <p>5/09 • • • the elements being rotary or moving along a closed circular path, e.g. rotary cutter, digging wheels</p> <p>5/10 • by application of heat (stationary blowing or paving-heating means E01C 11/26)</p> <p>5/12 • Apparatus or implements specially adapted for breaking, disintegrating, or loosening layers of ice or hard snow</p> <p>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 (E01H 8/10 takes precedence)</p> <p>8/00 Removing undesirable matter from the permanent way of railways; Removing undesirable matter from tramway rails (E01H 1/00-E01H 6/00 take precedence)</p> <p>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 E01H 8/10)</p> <p>8/04 • • essentially by non-driven elements</p> <p>8/06 • • essentially by driven tools</p> <p>8/08 • • by application of heat (heated track E01B 19/00)</p> <p>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 E01B 19/00; built-in draining devices for rails E01B 21/02; removing ballast from rails E01B 27/04)</p> <p>8/12 • • specially adapted to grooved rails, flangeways, or the like</p> <p>10/00 Improving gripping of ice-bound or other slippery traffic surfaces, e.g. using gritting or thawing materials (roughening ice by means of tools E01H 5/12; applying de-icing agents to rails E01H 8/10; thawing materials C09K 3/18; by constructional features E01C 11/24)</p> |
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11/00 Control of undesirable vegetation on roads or permanent ways of railways (destruction of undesirable vegetation in general A01M 7/00-A01M 15/00, A01M 21/00; weeding involving working the ballast E01B 27/00); **Applying liquids, e.g. water, weed-killer, bitumen, to permanent ways** (specially to rails E01H 8/10; for preserving sleepers E01B 31/20)

12/00 Cleaning beaches

13/00 Dispersing fog in general, e.g. on roads, on airfields

15/00 Removing undesirable matter, e.g. rubbish, from the land, not otherwise provided for (gatherers for removing stones, roots or the like from the soil A01B 43/00) [4]

E02 HYDRAULIC ENGINEERING; FOUNDATIONS; SOIL-SHIFTING

E02B HYDRAULIC ENGINEERING (ship-lifting E02C; dredging E02F)

Subclass index

METHODS AND EQUIPMENT IN GENERAL.....1/00, 3/00
 ARTIFICIAL WATER CANALS.....5/00
 BARRAGES OR WEIRS.....7/00, 8/00
 WATER-POWER PLANTS.....9/00
 DRAINAGE; IRRIGATION; CLEANING OF SURFACE OF OPEN WATER.....11/00, 13/00, 15/00
 ARTIFICIAL ISLANDS MOUNTED ON PILES OR LIKE SUPPORTS.....17/00

1/00 Equipment or apparatus for, or methods of, general hydraulic engineering

1/02 • Hydraulic models

3/00 Engineering work in connection with control or use of streams, rivers, coasts, or other marine sites (barrages or weirs E02B 7/00); **Sealings or joints for engineering work in general**

3/02 • Stream regulation, e.g. breaking up subaqueous rock, cleaning the beds of waterways, directing the water flow (dredging or scraping devices E02F)

3/04 • Structures or apparatus for, or methods of, protecting banks, coasts, or harbours (sealings or joints E02B 3/16)

3/06 • • Moles; Piers; Quays; Quay walls; Groynes; Breakwaters

3/08 • • • Structures of loose stones with or without piles (piles E02D 5/00)

3/10 • • Dams; Dykes; Sluice ways or other structures for dykes, dams, or the like (making embankments or dams in general E02D 17/18)

3/12 • • Revetment of banks, dams, watercourses, or the like (of slopes in general E02D 17/20)

3/14 • • • Preformed blocks; Arrangements thereof

3/16 • Sealings or joints (joints for foundation structures E02D 29/16; sealing joints not restricted to hydraulic engineering work E04B 1/68)

3/18 • Reclamation of land from water (drainage of soil E02B 11/00)

3/20 • Equipment for shipping on coasts, in harbours or on other fixed marine structures, e.g. bollards (tying-up, anchoring B63B 21/00, e.g. bollards for shipping B63B 21/06; buoys B63B 22/00) [5]

3/24 • • Mooring posts [5]

3/26 • • Fenders (fenders integral with waterborne vessels or specially adapted therefor B63B 59/02) [5]

3/28 • • Fender piles [5]

5/00 Artificial water canals (for water-power plants E02B 9/02; irrigation of soil E02B 13/00)

5/02 • Making or lining canals

5/04 • Navigable canals

5/06 • • Operating equipment in connection with canals (ship-lifting devices E02C)

5/08 • Details, e.g. gates, screens

7/00 Barrages or weirs; Layout, construction, methods of, or devices for, making same (for protecting banks, coasts, or harbours E02B 3/04; sealings or joints E02B 3/16; handling building or like materials for hydraulic engineering E02D 15/00; foundations in general E02D 27/00)

7/02 • Fixed barrages

7/04 • • Dams across valleys

7/06 • • • Earth-fill dams; Rock-fill dams

7/08 • • • Wall dams

7/10 • • • • Gravity dams, i.e. those in which the weight of the structure prevents overturning

7/12 • • • • Arch dams

7/14 • • • • Buttress dams

7/16 • Fixed weirs; Superstructures or flash-boards therefor

7/18 • • Siphon weirs

7/20 • Movable barrages; Lock gates

7/22 • • Stop log dams; Emergency gates

7/24 • • Needle weirs

7/26 • • Vertical-lift gates

7/28 • • • with sliding gates

7/30 • • • with guide wheels or rollers for the gates

7/32 • • • Cylindrical or tubular gates

7/34 • • • Flash-boards for vertical-lift gates

7/36 • • • Elevating mechanisms for vertical-lift gates

7/38 • • Rolling gates

7/40 • • Swinging or turning gates

7/42 • • • Gates of segmental or sector-like shape with horizontal axis

7/44 • • • Hinged-leaf gates

7/46 • • • Gates turning round a horizontal axis arranged midway of the flap

7/48 • • • Roof or double shutter gates

7/50 • • Floating gates

E02B

- 7/52 • • Equipment preventing vibration of gates
- 7/54 • • Sealings for gates
- 8/00 Details of barrages or weirs** (cleaning or keeping clear the surface of open water E02B 15/00)
- 8/02 • Sediment base gates; Sand sluices; Structures for arresting waterborne material
- 8/04 • Valves, slides, or the like; Submerged sluice gates
- 8/06 • Spillways; Devices for dissipation of energy, e.g. for reducing eddies
- 8/08 • Fish passes; Passages for rafts or boats
- 9/00 Water-power plants; Layout, construction or equipment, methods of, or apparatus for, making same** (hydraulic motors F03B)
- 9/02 • Water-ways
- 9/04 • • Free-flow canals or flumes; Intakes (gratings or screens therefor E02B 5/08)
- 9/06 • • Pressure galleries or pressure conduits; Galleries specially adapted to house pressure conduits; Means specially adapted for use therewith, e.g. housings, valves, gates (driving inclined galleries E21D 9/02; valves in general F16K; conduits in general F16L) [6]
- 9/08 • Tide or wave power plants (water-pressure machines, tide or wave motors F03B)
- 11/00 Drainage of soil, e.g. for agricultural purposes**
- 11/02 • Drainage-device-laying apparatus, e.g. drainage ploughs
- 13/00 Irrigation ditches, i.e. gravity flow, open channel water distribution systems** (other distribution systems for watering or spraying gardens, fields, sports grounds, or the like A01G 25/00) [2]

- 13/02 • Closures for irrigation conduits
- 15/00 Cleaning or keeping clear the surface of open water; Apparatus therefor** (construction of ships or other waterborne vessels B63B, e.g. vessels specially adapted for collecting pollution from open water B63B 35/32; in swimming or splash baths or pools E04H 4/16) [5]
- 15/02 • from ice [5]
- 15/04 • Devices for cleaning or keeping clear the surface of open water from oil or like floating materials by separating or removing these materials (other treatment of water, waste water or sewage C02F; materials for treating liquid pollutants, e.g. oil, gasoline, fat, C09K 3/32)
- 15/06 • • Barriers therefor (E02B 15/08 takes precedence) [5]
- 15/08 • • Devices for reducing the polluted area without removing the material [5]
- 15/10 • • Devices for removing the material from the surface [5]
- 17/00 Artificial islands mounted on piles or like supports, e.g. platforms on raisable legs; Construction methods therefor** (fenders E02B 3/26; anchoring floating platforms B63B 21/00; floating platforms, e.g. anchored, B63B 35/44; independent underwater structures E02D 29/00) [5]
- 17/02 • placed by lowering the supporting construction to the bottom, e.g. with subsequent fixing thereto
- 17/04 • Equipment specially adapted for raising, lowering, or immobilising the working platform relative to the supporting construction (platform lifts in general B66F 7/00)
- 17/06 • • for immobilising, e.g. using wedges or clamping rings
- 17/08 • • for raising or lowering

E02C SHIP-LIFTING DEVICES OR MECHANISMS

- 1/00 Locks; Shaft locks, i.e. locks of which one front side is formed by a solid wall with an opening in the lower part through which the ships pass** (lock gates E02B 7/20)
- 1/02 • with auxiliary basins
- 1/04 • with floating troughs
- 1/06 • Devices for filling or emptying locks (in lock gates E02B 7/20)
- 1/08 • Arrangements for dissipating the energy of the water (carried by lock gates E02B 8/06)

- 1/10 • Equipment for use in connection with the navigation of ships in locks; Mooring equipment (tying-up, anchoring waterborne vessels B63B 21/00; equipment for shipping on coasts, in harbours or on other fixed marine structures E02B 3/20)
- 3/00 Inclined-plane ship-lifting mechanisms**
- 5/00 Mechanisms for lifting ships vertically** (salvaging sunken vessels B63C 7/00)
- 5/02 • with floating chambers

E02D FOUNDATIONS; EXCAVATIONS; EMBANKMENTS (specially adapted for hydraulic engineering E02B); UNDERGROUND OR UNDERWATER STRUCTURES [6]

Note(s)

1. This subclass covers underground structures made by foundation engineering, i.e. involving disturbance of the ground surface.
2. This subclass does not cover underground spaces, made by underground mining methods only, i.e. not involving disturbance of the ground surface, which are covered by subclass E21D.

Subclass index

INVESTIGATING, IMPROVING OR PRESERVING FOUNDATION SOIL OR ROCK.....1/00, 3/00

STRUCTURAL ELEMENTS AND TECHNIQUES THEREFOR

Structural elements.....5/00

Placing; removing; placing and removing; accessories.....7/00, 9/00, 11/00, 13/00

HANDLING MATERIALS.....	15/00
EXCAVATIONS, MAKING EMBANKMENTS.....	17/00
KEEPING DRY FOUNDATION SITES.....	19/00
CAISSONS.....	23/00, 25/00
FOUNDATIONS AS SUBSTRUCTURES; UNDERGROUND OR UNDERWATER STRUCTURES, RETAINING WALLS.....	27/00, 29/00
PROTECTING, TESTING, STRAIGHTENING, LIFTING, REPAIRING.....	31/00-37/00

- | | |
|--|--|
| <p>1/00 Investigation of foundation soil in situ (investigation involving boring or specially adapted to earth drilling E21B 25/00, E21B 49/00; investigating or analysing materials by determining their chemical or physical properties, in general G01N, e.g. sampling G01N 1/00)</p> <p>1/02 • before construction work</p> <p>1/04 • • Sampling of soil</p> <p>1/06 • • Sampling of ground water</p> <p>1/08 • after finishing the foundation structure</p> <p>3/00 Improving or preserving soil or rock, e.g. preserving permafrost soil (securing of slopes or inclines E02D 17/20; damming or interrupting passage of underground water E02D 19/12; improving soil for agricultural purposes A01; soil stabilisation for road building or like purposes E01C 21/00, E01C 23/10; setting rock anchoring bolts E21D)</p> <p>3/02 • Improving by compacting (E02D 3/11 takes precedence; compacting soil locally before or while forming foundations E02D 27/26, E02D 27/28) [3]</p> <p>3/026 • • by rolling with rollers usable only for or specially adapted for soil compaction, e.g. sheepfoot rollers (rollers for soil working in agriculture A01B 29/00; rollers for road paving, such rollers usable also for compacting soil E01C 19/23) [3]</p> <p>3/032 • • • Trench rollers [3]</p> <p>3/039 • • • Slope rollers [3]</p> <p>3/046 • • by tamping or vibrating, e.g. with auxiliary watering of the soil (E02D 3/026, E02D 3/08 take precedence; tamping or vibrating apparatus for working ballast on railways E01B 27/00, for consolidating paving materials E01C 19/30, for consolidating concrete in general E04G 21/06) [3]</p> <p>3/054 • • • involving penetration of the soil, e.g. vibroflotation [3]</p> <p>3/061 • • • Tampers with directly acting explosion chambers (pile drivers with explosion chambers E02D 7/12) [3]</p> <p>3/068 • • • Vibrating apparatus operating with systems involving reciprocating masses (E02D 3/054, E02D 3/061 take precedence) [3]</p> <p>3/074 • • • Vibrating apparatus operating with systems involving rotary unbalanced masses (E02D 3/054 takes precedence) [3]</p> <p>3/08 • • by inserting stones or lost bodies, e.g. compaction piles (sand drains for soil compaction E02D 3/10; stressing soil while forming foundations E02D 27/28)</p> <p>3/10 • • by watering, draining, de-aerating or blasting, e.g. by installing sand or wick drains (E02D 3/11 takes precedence; soil-penetrating vibrators with auxiliary watering E02D 3/054; drainage of soil in general E02B 11/00) [3]</p> <p>3/11 • by thermal, electrical or electro-chemical means (freezing soil for interrupting passage of underground water E02D 19/14) [3]</p> <p>3/115 • • by freezing [3]</p> | <p>3/12 • Consolidating by placing solidifying or pore-filling substances in the soil (making piles E02D 5/46; soil-conditioning or soil-stabilising materials C09K 17/00)</p> <p>5/00 Bulkheads, piles, or other structural elements specially adapted to foundation engineering (engineering elements in general F16)</p> <p>5/02 • Sheet piles or sheet pile bulkheads</p> <p>5/03 • • Prefabricated parts</p> <p>5/04 • • • made of steel</p> <p>5/06 • • • • Fitted piles or other elements specially adapted for closing gaps between two sheet piles or between two walls of sheet piles</p> <p>5/08 • • • • Locking forms; Edge joints; Pile crossings; Branch pieces</p> <p>5/10 • • • made of concrete or reinforced concrete</p> <p>5/12 • • • • Locking forms; Edge joints; Pile crossings; Branch pieces</p> <p>5/14 • • Sealing joints between adjacent piles (sealing joints not restricted to foundation piles E04B 1/68)</p> <p>5/16 • • Auxiliary devices rigidly or detachably arranged on sheet piles for facilitating assembly</p> <p>5/18 • Bulkheads or similar walls made solely of concrete <u>in situ</u></p> <p>5/20 • Bulkheads or similar walls made of prefabricated parts and concrete, including reinforced concrete, <u>in situ</u></p> <p>5/22 • Piles (sheet piles E02D 5/02)</p> <p>5/24 • • Prefabricated piles</p> <p>5/26 • • • made of timber with or without reinforcement; Means affording protection against spoiling of the wood (cases E02D 5/60; impregnating agents B27K 3/16); Self-cleaning of piles placed in water</p> <p>5/28 • • • made of steel</p> <p>5/30 • • • made of concrete or reinforced concrete or made of steel and concrete</p> <p>5/32 • • • with arrangements for setting in position by fluid jets</p> <p>5/34 • • Concrete or concrete-like piles cast in position</p> <p>5/36 • • • making without use of mould-pipes or other moulds</p> <p>5/38 • • • making by use of mould-pipes or other moulds</p> <p>5/40 • • • • in open water</p> <p>5/42 • • • • by making use of pressure liquid or pressure gas for compacting the concrete</p> <p>5/44 • • • • with enlarged footing or enlargements at the bottom of the pile</p> <p>5/46 • • • making <u>in situ</u> by forcing bonding agents into gravel fillings or the soil (consolidating soil in general E02D 3/12)</p> <p>5/48 • • Piles varying in construction along their length</p> <p>5/50 • • Piles comprising both precast concrete portions and concrete portions cast <u>in situ</u></p> <p>5/52 • • Piles composed of separable parts, e.g. telescopic tubes</p> |
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- 5/54 • • Piles with prefabricated supports or anchoring parts; Anchoring piles
- 5/56 • • Screw piles
- 5/58 • • Prestressed concrete piles
- 5/60 • • Piles with protecting cases
- 5/62 • • Compacting the soil at the footing or in a casing by forcing cement or like material through tubes
- 5/64 • • Repairing piles
- 5/66 • Mould-pipes or other moulds
- 5/68 • • for making bulkheads
- 5/70 • • for making sheet piles
- 5/72 • Pile shoes
- 5/74 • Means for anchoring structural elements or bulkheads (anchoring piles E02D 5/54)
- 5/76 • • Anchorings for bulkheads or sections thereof
- 5/80 • • Ground anchors

7/00 Methods or apparatus for placing sheet pile bulkheads, piles, mould-pipes, or other moulds (for both placing and removing E02D 11/00)

- 7/02 • Placing by driving
- 7/04 • • Hand pile-drivers
- 7/06 • • Power-driven drivers
- 7/08 • • • Drop drivers with free-falling hammer
- 7/10 • • • with pressure-operated hammer
- 7/12 • • • Drivers with explosion chambers
- 7/14 • • • Components for drivers
- 7/16 • • • • Scaffolds for drivers
- 7/18 • Placing by vibrating
- 7/20 • Placing by pressure or pulling power
- 7/22 • Placing by screwing down
- 7/24 • Placing by using fluid jets
- 7/26 • Placing by using several means simultaneously
- 7/28 • Placing of hollow piles or mould-pipes by means arranged inside the piles or pipes
- 7/30 • • by driving cores

9/00 Removing sheet pile bulkheads, piles, mould-pipes, or other moulds (for both placing and removing E02D 11/00)

- 9/02 • by withdrawing
- 9/04 • by cutting-off under water

11/00 Methods or apparatus for both placing and removing sheet pile bulkheads, piles, or mould-pipes (features relating to placing only E02D 7/00, to removing only E02D 9/00)

13/00 Accessories for placing or removing piles or bulkheads

- 13/02 • specially adapted for placing or removing bulkheads
- 13/04 • Guide devices; Guide frames
- 13/06 • for observation while placing
- 13/08 • Removing obstacles
- 13/10 • Follow-blocks of pile-drivers or like devices

15/00 Handling building or like materials for hydraulic engineering or foundations (conveying or working-up concrete or similar masses in general E04G 21/02)

- 15/02 • Handling of bulk concrete specially for foundation purposes
- 15/04 • • Placing concrete in mould-pipes, pile tubes, boreholes, or narrow shafts
- 15/06 • • Placing concrete under water
- 15/08 • Sinking workpieces into water or soil
- 15/10 • Placing gravel or like material under water

17/00 Excavations; Bordering of excavations; Making embankments (soil shifting apparatus E02F; earth drilling E21)

- 17/02 • Foundation pits
- 17/04 • • Bordering or stiffening the sides of foundation pits
- 17/06 • Foundation ditches or narrow shafts
- 17/08 • • Bordering or stiffening the sides of ditches or narrow shafts for foundations
- 17/10 • • Covering trenches for foundations
- 17/12 • • Back-filling of foundation trenches or ditches
- 17/13 • Foundation slots; Implements for making these slots
- 17/16 • Loosening of soil or rock, under water (for correcting streams E02B 3/02; by dredgers or excavators E02F)
- 17/18 • Making embankments (E02D 17/20 takes precedence)
- 17/20 • Securing of slopes or inclines

19/00 Keeping dry foundation sites or other areas in the ground (sheet piles or bulkheads E02D 5/02)

- 19/02 • Restraining of open water
- 19/04 • • by coffer-dams
- 19/06 • Restraining of underground water
- 19/08 • • by employing open ditches arranged below the level of the water
- 19/10 • • by lowering level of ground water
- 19/12 • • by damming or interrupting the passage of underground water
- 19/14 • • • by freezing the soil (in connection with sinking shafts E21D 1/12)
- 19/16 • • • by placing or applying sealing substances (consolidating by placing solidifying or pore-filling substances in the soil E02D 3/12)
- 19/18 • • • by making use of sealing aprons (sealings or joints for engineering work E02B 3/16)
- 19/20 • • • by displacing the water, e.g. by compressed air
- 19/22 • Lining sumps in trenches

23/00 Caissons; Construction or placing of caissons (tunnels submerged into or built in open water E02D 29/063) [6]

- 23/02 • Caissons able to be floated on water and to be lowered into water in situ
- 23/04 • Pneumatic caissons
- 23/06 • • Bringing persons or material into, or out of, compressed air caissons
- 23/08 • Lowering or sinking caissons
- 23/10 • • Caissons filled with compressed air
- 23/12 • • Inclined lowering
- 23/14 • • Decreasing the skin friction while lowering
- 23/16 • Jointing caissons to the foundation soil, specially to uneven foundation soil

25/00 Joining caissons or like sunk units to each other under water

27/00 Foundations as substructures

- 27/01 • Flat foundations
- 27/02 • • Flat foundations without substantial excavation (E02D 27/04, E02D 27/08 take precedence)
- 27/04 • • in water or on quicksand
- 27/06 • • • Floating caisson foundations
- 27/08 • • Reinforcements for flat foundations
- 27/10 • Deep foundations
- 27/12 • • Pile foundations
- 27/14 • • • Pile framings
- 27/16 • • • Foundations formed of separate piles
- 27/18 • • Foundations formed by making use of caissons

- 27/20 • • Caisson foundations combined with pile foundations
- 27/22 • • Caisson foundations made by starting from fixed or floating artificial islands by using protective bulkheads
- 27/24 • Foundations constructed by making use of diving-bells (equipment for dwelling or working under water B63C 11/00)
- 27/26 • Compacting soil locally before forming foundations; Construction of foundation structures by forcing binding substances into gravel fillings (consolidating foundation soil in general E02D 3/02-E02D 3/12)
- 27/28 • Stressing the soil or the foundation structure while forming foundations
- 27/30 • Foundations made with permanent use of sheet pile bulkheads, walls of planks, or sheet piling boxes
- 27/32 • Foundations for special purposes
- 27/34 • • Foundations for sinking or earthquake territories (building constructions with protection arrangements against earthquakes E04H 9/02)
- 27/35 • • Foundations formed in frozen ground, e.g. in permafrost soil [3]
- 27/36 • • Foundations formed in moors or bogs
- 27/38 • • Foundations for large tanks, e.g. oil tanks
- 27/40 • • Foundations for dams across valleys or for dam constructions
- 27/42 • • Foundations for poles, masts, or chimneys
- 27/44 • • Foundations for machines, engines, or ordnance (special layout of foundations with respect to machinery to be supported F16M 9/00)
- 27/46 • • Foundations for supply conduits or other canals
- 27/48 • • Foundations inserted underneath existing buildings or constructions
- 27/50 • • Anchored foundations
- 27/52 • • Submerged foundations
- 29/00 Underground or underwater structures** (underground tanks B65D 88/76; hydraulic engineering, e.g. sealings or joints, E02B; underground garages E04H 6/00; underground air-raid shelters E04H 9/12; burial vaults E04H 13/00); **Retaining walls** [6]
- 29/02 • Retaining or protecting walls (piers or quay walls E02B 3/06)
- 29/045 • Underground structures, e.g. tunnels or galleries, built in the open air or by methods involving disturbance of the ground surface all along the location line; Methods of making them [6]
- 29/05 • • at least part of the cross-section being constructed in an open excavation or from the ground surface, e.g. assembled in a trench [6]
- 29/055 • • • further excavation of the cross-section proceeding underneath an already installed part of the structure, e.g. the roof of a tunnel [6]
- 29/063 • Tunnels submerged into, or built in, open water (construction or placing of caissons in general E02D 23/00; joining caissons to each other under water, in general E02D 25/00) [6]
- 29/067 • • Floating tunnels; Submerged bridge-like tunnels, i.e. tunnels supported by piers or the like above the water-bed (pontoons or floating bridges E01D 15/14) [6]
- 29/07 • • Tunnels or shuttering therefor preconstructed as a whole or continuously made, and moved into place on the water-bed, e.g. into a preformed trench [6]
- 29/073 • • Tunnels or shuttering therefor assembled from sections individually sunk onto, or laid on, the water-bed, e.g. in a preformed trench (caisson-type sections lowered onto the water-bed E02D 29/077) [6]
- 29/077 • • Tunnels at least partially built beneath the water-bed characterised by being made by methods involving disturbance thereof all along the location line, e.g. by cut-and-cover or caisson methods [6]
- 29/09 • Constructions or methods of constructing, in water, not otherwise provided for [6]
- 29/12 • Manhole shafts; Other inspection or access chambers; Accessories therefor (for underground tanks B65D 90/10; for sewerage E03F 5/02) [6]
- 29/14 • • Covers for manholes or the like; Frames for covers [6]
- 29/16 • Arrangement or construction of joints in foundation structures (sealing joints not restricted to foundation structures E04B 1/68)
- 31/00 Protective arrangements for foundations or foundation structures; Ground foundation measures for protecting the soil or the subsoil water, e.g. preventing or counteracting oil pollution** (spillage retaining means for tanks B65D 90/24)
 - 31/02 • against ground humidity or ground water
 - 31/04 • • Watertight packings for use under hydraulic pressure
 - 31/06 • against corrosion by soil or water
 - 31/08 • against transmission of vibrations or movements in the foundation soil
 - 31/10 • against soil pressure or hydraulic pressure
 - 31/12 • • against upward hydraulic pressure
 - 31/14 • • against frost heaves in soil [3]
- 33/00 Testing foundations or foundation structures** (testing methods or apparatus, see the relevant subclasses of class G01; testing structures or apparatus as regards function, in general, G01M; investigating or analysing materials by determining their chemical or physical properties, in general G01N)
- 35/00 Straightening, lifting, or lowering of foundation structures or of constructions erected on foundations**
- 37/00 Repair of damaged foundations or foundation structures**

E02F DREDGING; SOIL-SHIFTING (winning peat E21C 49/00)

Note(s)

This subclass covers:

- primarily equipment for excavating or loosening earth or for moving loose earth;
- equipment for working similarly on other materials and similar equipment for loading or unloading materials.

Subclass index

GENERAL WORKING METHODS.....	1/00
HAND-OPERATED MACHINES OR APPARATUS FOR GENERAL USE.....	3/02
MECHANICALLY-DRIVEN MACHINES OR APPARATUS FOR GENERAL USE OR THEIR SPECIAL DETAILS.....	3/04
MACHINES FOR SPECIAL PURPOSES OR THEIR SPECIAL DETAILS.....	5/00
EQUIPMENT FOR CONVEYING OR SEPARATING EXCAVATED MATERIAL.....	7/00
GENERAL DETAILS.....	9/00

1/00	General working methods with dredgers or soil-shifting machines (methods for making embankments E02D 17/18; methods for mining E21C)	3/43	• • • • Control of dipper or bucket position; Control of sequence of drive operations [4]
3/00	Dredgers; Soil-shifting machines (for special purposes E02F 5/00; other machines or apparatus for mining E21C; tunnelling E21D)	3/46	• • with reciprocating digging or scraping elements moved by cables or hoisting ropes [4]
3/02	• hand-operated	3/47	• • • with grab buckets (grab equipment for cranes B66C) [4]
3/04	• mechanically-driven	3/48	• • • Drag-lines
3/06	• • with digging screws	3/50	• • • with buckets or other digging elements moved along a rigid guideway
3/08	• • with digging elements on an endless chain (conveyers B65G)	3/52	• • • Cableway excavators (cable cranes B66C)
3/10	• • • with tools that only loosen the material	3/54	• • • Cable scrapers
3/12	• • • Component parts	3/56	• • • • with hand-controlled scraper or other digging elements
3/14	• • • • Buckets; Chains; Guides for buckets or chains; Drives for chains	3/58	• • • Component parts
3/16	• • • • Safety or control devices (safety devices in general F16P; controlling in general G05)	3/60	• • • • Buckets, scrapers, or other digging elements
3/18	• • with digging wheels turning round an axis	3/627	• • Devices to connect beams or arms to a tractor or similar self-propelled machine [4]
3/20	• • • with tools that only loosen the material	3/633	• • • Drives therefor [4]
3/22	• • • Component parts	3/64	• • Bucket cars, i.e. having scraper bowls [4]
3/24	• • • • Digging wheels; Digging elements of wheels; Drives for wheels	3/65	• • • Component parts, e.g. drives, control devices [4]
3/26	• • • • Safety or control devices (safety devices in general F16P; controlling in general G05)	3/76	• • Graders, bulldozers, or the like with scraper plates or ploughshare-like elements (soil working A01B); Levelling devices [4]
3/28	• • with digging tools mounted on a dipper- or bucket-arm, e.g. dippers, buckets [4]	3/78	• • • with rotating digging elements
3/30	• • • with a dipper-arm pivoted on a cantilever beam	3/80	• • • Component parts
3/32	• • • • working downwardly and towards the machine, e.g. with backhoes	3/815	• • • • Blades; Levelling tools [4]
3/34	• • • with bucket-arms directly pivoted on the frames of tractors or self-propelled machines [4]	3/84	• • • • Drives or control devices therefor
3/342	• • • • Buckets emptying overhead (E02F 3/348-E02F 3/358 take precedence) [4]	3/85	• • • • • Applications of hydraulic or pneumatic systems
3/345	• • • • Buckets emptying side-ways (E02F 3/348-E02F 3/358 take precedence) [4]	3/88	• • with arrangements acting by a sucking or forcing effect, e.g. suction dredgers (pumps in general F04)
3/348	• • • • Buckets emptying into a collecting or conveying device [4]	3/90	• • • Component parts, e.g. drives, control devices
3/352	• • • • Buckets movable along a fixed guide [4]	3/92	• • • • Digging elements, e.g. suction heads
3/355	• • • • Buckets connected to the rear end of a tractor [4]	3/94	• • • • Apparatus for separating stones from the dredged material
3/358	• • • • Bucket-arms pivoted on a turntable being part of a tractor frame [4]	3/96	• • with arrangements for alternate use of different digging elements
3/36	• • • Component parts	5/00	Dredgers or soil-shifting machines for special purposes
3/38	• • • • Cantilever beams; Dipper-arms; Bucket-arms [4]	5/02	• for digging trenches or ditches (agricultural ploughs for working ridges A01B 13/02)
3/39	• • • • • with telescopic arms [4]	5/04	• • with digging screws
3/40	• • • • Dippers; Buckets [4]	5/06	• • with digging elements mounted on an endless chain
3/407	• • • • • with ejecting device [4]	5/08	• • with digging wheels turning round an axis
3/413	• • • • • with grabbing device (grab equipment for cranes B66C) [4]	5/10	• • with arrangements for reinforcing trenches or ditches; with arrangements for making or assembling conduits or for laying conduits or cables (laying pipes <i>per se</i> F16L 1/00; making pipes <i>in situ</i> F16L 1/038; laying electric cables <i>per se</i> H02G 1/06) [6]
3/42	• • • • Drives for dippers, buckets, dipper-arms or bucket-arms [4]		

- 5/12 • • with equipment for back-filling trenches or ditches (E02F 5/10 takes precedence) [3]
- 5/14 • • Component parts for trench excavators, e.g. indicating devices
- 5/16 • Machines for digging other holes in the soil (earth drilling E21)
- 5/18 • • for horizontal holes
- 5/20 • • for vertical holes
- 5/22 • for making embankments; for back-filling (in combination with trench excavators E02F 5/12)
- 5/24 • • Depositing dredged material in mounds
- 5/26 • • Combined conveying-bridges and dredgers
- 5/28 • for cleaning watercourses or other waters
- 5/30 • Auxiliary apparatus, e.g. for thawing, cracking, blowing-up, or other preparatory treatment of the soil
- 5/32 • • Rippers [4]
- 7/00 Equipment for conveying or separating excavated material** (barges adapted for carrying-away material from floating dredgers B63B 35/28)
- 7/02 • Conveying equipment mounted on a dredger (conveyers in general B65G)
- 7/04 • Loading devices mounted on a dredger (loading devices in general B65G)
- 7/06 • Delivery chutes or screening plants mounted on a dredger (separating equipment in general B03; delivery chutes in general B65G)
- 7/10 • Pipe-lines for conveying excavated materials (pipes in general F16L; pipe-line systems F17D)
- 9/00 Component parts of dredgers or soil-shifting machines, not restricted to one of the kinds covered by groups E02F 3/00-E02F 7/00** (laying-out or take-up devices for trailing electric cables B66C) [3]
- 9/02 • Travelling gear (for motor vehicles B60B, B60G; undercarriages for locomotives or railroad cars B61F; track-laying vehicles B62D; for cranes B66C)
- 9/04 • • Walking gears moving the dredger forward step-by-step
- 9/06 • Floating substructures as supports
- 9/08 • Superstructures; Supports for superstructures
- 9/10 • • Supports for movable superstructures mounted on travelling or walking gears or on other superstructures
- 9/12 • • • Slewing or traversing gears (roller and ball bearings F16C)
- 9/14 • Booms; Cable suspensions
- 9/16 • Cabins, platforms, or the like for the driver (for cranes B66C 13/54)
- 9/18 • Counterweights
- 9/20 • Drives; Control devices (gearing in general F16H; controlling in general G05; electric multi-motor drives H02K, H02P)
- 9/22 • • Hydraulic or pneumatic drives
- 9/24 • Safety devices
- 9/26 • Indicating devices
- 9/28 • Small metalwork for digging elements, e.g. teeth

E03 WATER SUPPLY; SEWERAGE

E03B INSTALLATIONS OR METHODS FOR OBTAINING, COLLECTING, OR DISTRIBUTING WATER (drilling wells, obtaining fluids in general from wells E21B; pipe-line systems in general F17D)

Subclass index

LAYOUT.....	1/00, 5/00
METHODS.....	1/00, 3/00, 9/00
INSTALLATIONS.....	3/00, 5/00, 9/00
PIPE SYSTEMS; TANKS.....	7/00, 11/00

- 1/00 Methods or layout of installations for water supply** (E03B 3/00, E03B 9/00 take precedence) [4]
- 1/02 • for public or like main supply
- 1/04 • for domestic or like local supply
- 3/00 Methods or installations for obtaining or collecting drinking water or tap water** (treatment of water C02F) [4]
- 3/02 • from rain-water
- 3/03 • • Special vessels for collecting or storing rain-water for use in the household, e.g. water-butts
- 3/04 • from surface water
- 3/06 • from underground
- 3/08 • • Obtaining and confining water by means of wells (applicable to a combination of water and other liquids or to other liquids only E21B 43/00)
- 3/10 • • • by means of pit wells
- 3/11 • • • • in combination with tubes, e.g. perforated, extending horizontally, or upwardly inclined, exterior to the pits
- 3/12 • • • by means of vertical pipe wells
- 3/14 • • • by means of horizontal or oblique wells
- 3/15 • • • Keeping wells in good condition, e.g. by cleaning, repairing, regenerating; Maintaining or enlarging the capacity of wells or water-bearing layers (with artificial enrichment E03B 3/32)
- 3/16 • • • Component parts of wells
- 3/18 • • • • Well filters (filters in general B01D 24/00-B01D 35/00)
- 3/20 • • • • • of elements of special shape
- 3/22 • • • • • Selection of specified materials
- 3/24 • • • • • formed of loose materials, e.g. gravel
- 3/26 • • • • • with packed filtering material
- 3/28 • from humid air (condensing of vapours in general B01D 5/00; dehumidification of air for air-conditioning F24F 3/14)
- 3/30 • from snow or ice [4]

E03B

- 3/32 • with artificial enrichment, e.g. by adding water from a pond or a river
- 3/34 • • of underground water
- 3/36 • • of surface water
- 3/38 • Curbs for springs
- 3/40 • Other devices for confining, e.g. trenches, drainage
- 5/00 Use of pumping plants or installations; Layouts thereof** (pumps, pumping plants or installations per se, F04)
 - 5/02 • arranged in buildings
 - 5/04 • arranged in wells
 - 5/06 • • Special equipment
- 7/00 Water main or service pipe systems** (pipes or tubes in general F16L)
 - 7/02 • Public or like main pipe systems
 - 7/04 • Domestic or like local pipe systems (domestic plumbing E03C 1/02)
 - 7/07 • Arrangement of devices, e.g. filters, flow controls, measuring devices, siphons, valves, in the pipe systems (devices per se, see the relevant classes for these devices)
 - 7/08 • • Arrangement of draining devices (draining devices in general F16K, F16L)
 - 7/09 • Component parts or accessories (tools for cleaning pipes B08B 9/02; devices for preventing contamination of drinking water pipes for domestic use E03C 1/10; devices for preventing damage in case of bursts of pipes F16L; heating of pipes in general F16L 53/00)
 - 7/10 • • Devices preventing bursting of pipes by freezing (devices preventing bursting of pipes in general F16L 55/00)
 - 7/12 • • • by preventing freezing

- 7/14 • • Devices for thawing frozen pipes

9/00 Methods or installations for drawing-off water (domestic water-drawing devices E03C; taps or valves per se F16K) [4]

- 9/02 • Hydrants; Arrangement of valves therein; Keys for hydrants
- 9/04 • • Column hydrants
- 9/06 • • • Covers
- 9/08 • • Underground hydrants
- 9/10 • • • Protective plates or covers
- 9/12 • • • Stand-pipes
- 9/14 • • Draining devices for hydrants
- 9/16 • • Devices for retaining foreign matter, e.g. sand
- 9/18 • • Cleaning tools for hydrants
- 9/20 • • Pillar fountains or like apparatus for dispensing drinking water

11/00 Arrangements or adaptations of tanks for water supply (water-butts E03B 3/03; storage aspects B65D, B65G, F17B, F17C; foundations E02D 27/38; construction or assembling of bulk storage containers employing civil engineering techniques E04H 7/00; tower aspects E04H 12/00)

- 11/02 • for domestic or like local water supply
- 11/04 • • without air regulator
- 11/06 • • with air regulator
- 11/08 • • • Air regulators
- 11/10 • for public or like main water supply
- 11/12 • • of high-level tanks
- 11/14 • • of underground tanks
- 11/16 • • Adaptations of devices for putting pumping plants in and out of operation, e.g. automatic control devices

E03C DOMESTIC PLUMBING INSTALLATIONS FOR FRESH WATER OR WASTE WATER (not connected to either water-supply main or to waste pipe A47K; devices of the kind used in the ground E03B, E03F); **SINKS**

1/00 Domestic plumbing installations for fresh water or waste water; Sinks

- 1/01 • for combinations of baths, showers, sinks, wash-basins, closets, urinals, or the like
- 1/02 • Plumbing installations for fresh water
- 1/04 • • Water-basin installations specially adapted to wash-basins or baths (valves, faucets, mixing valves, taps F16K)
- 1/042 • • • Arrangements on taps for wash-basins or baths for connecting to the wall
- 1/044 • • • having a heating or cooling apparatus in the supply line (water heaters, e.g. with continuous flow, F24H)
- 1/046 • • • Adding soap, disinfectant, or the like, in the supply line (preventing contamination of drinking-water pipes E03C 1/10)
- 1/048 • • • supplying water through two or more openings around or along one side of the water-basin
- 1/05 • • Arrangements of devices on wash-basins, baths, sinks, or the like, for remote control of taps (remote control of taps or the like, per se F16K)
- 1/06 • • Devices for suspending or supporting the supply pipe or supply hose of a shower-bath
- 1/08 • • Jet regulators, e.g. anti-splash devices
- 1/084 • • • Jet regulators with aerating means

- 1/086 • • • Jet regulators or jet guides, easily mountable on the outlet of taps
- 1/10 • • Devices for preventing contamination of drinking-water pipes, e.g. means for aerating self-closing flushing valves (vacuum-breakers in general F16K, F16L)
- 1/12 • Plumbing installations for waste water; Basins or fountains connected thereto (drainage devices in floors E03F 5/04); Sinks
- 1/122 • • Pipe-line systems for waste water in buildings (pipe-line systems in general F17D)
- 1/126 • • Installations for disinfecting or deodorising waste-water plumbing installations
- 1/14 • • Wash-basins connected to the waste pipe
- 1/16 • • Wash-fountains connected to the waste pipe
- 1/18 • • Sinks, whether or not connected to the waste-pipe
- 1/181 • • • Anti-splash devices in sinks (jet regulators E03C 1/08)
- 1/182 • • • connected to the waste pipe
- 1/184 • • • • adapted for attachment of washing machines or heating or cooling devices (washing machines for attachment D06F 7/00)
- 1/186 • • • Separate partition walls, lids, protecting borders, or the like, for sinks
- 1/20 • • Connecting baths or bidets to the waste pipe

- 1/22 • • • Outlet devices mounted in basins, baths, or sinks (stoppers A47K 1/14)
- 1/23 • • • with mechanical closure mechanisms
- 1/232 • • • • combined with overflow devices (overflow devices for basins or baths per se E03C 1/24)
- 1/24 • • • Overflow devices for basins or baths (E03C 1/232 takes precedence)
- 1/242 • • • automatically actuating supply or draining valves
- 1/244 • • • Separate devices to be placed on the outlet opening
- 1/26 • • • Object-catching inserts or similar devices for waste pipes or outlets (E03C 1/28 takes precedence)
- 1/262 • • • combined with outlet stoppers
- 1/264 • • • Separate sieves or similar object-catching inserts
- 1/266 • • • Arrangement of disintegrating apparatus in waste pipes or outlets; Disintegrating apparatus specially adapted for installation in waste pipes or outlets
- 1/28 • • • Odour seals
- 1/282 • • • combined with additional object-catching devices
- 1/284 • • • having U-shaped trap
- 1/286 • • • • having hand-operated valves against return of waste water
- 1/288 • • • • having non-return valves against return of waste water (E03C 1/286 takes precedence)
- 1/29 • • • having housing containing dividing wall, e.g. tubular
- 1/292 • • • • having elastic housing
- 1/294 • • • • with provisions against loss of water lock
- 1/295 • • • • using air-supply valves
- 1/296 • • • • using water-supply valves
- 1/298 • • • consisting only of non-return valve
- 1/30 • • • Devices to facilitate removing of obstructions in waste pipes or sinks
- 1/302 • • • using devices moved through the pipes
- 1/304 • • • using fluid under pressure
- 1/306 • • • • by means of a tube connected to the water mains
- 1/308 • • • • by means of a pumping device
- 1/32 • • • Holders or supports for basins
- 1/322 • • • connected to the wall only
- 1/324 • • • • adjustable
- 1/326 • • • resting on the floor
- 1/328 • • • • adjustable
- 1/33 • • • Fastening sinks or basins in an apertured support

E03D WATER-CLOSETS OR URINALS WITH FLUSHING DEVICES; FLUSHING VALVES THEREFOR

Subclass index

WATER-CLOSETS, FLUSHING DEVICES

General structure.....1/00, 3/00

Special constructions.....5/00, 7/00

ACCESSORIES, COMPONENT PARTS.....9/00, 11/00

URINALS.....13/00

1/00 Water flushing devices with cisterns

- 1/01 • Shape or selection of material for flushing cisterns
- 1/012 • • Details of shape of cisterns, e.g. for connecting to wall, for supporting or connecting flushing-device actuators
- 1/02 • High-level flushing systems
- 1/04 • • Cisterns with bell siphons
- 1/05 • • • with movable siphon bells
- 1/06 • • Cisterns with tube siphons
- 1/07 • • • with movable or deformable siphon tubes
- 1/08 • • Siphon action initiated by air or water pressure
- 1/10 • • • Siphon action initiated by raising the water level in the cistern, e.g. by means of displacement members
- 1/12 • • • Siphon action initiated by outlet of air
- 1/14 • • Cisterns discharging variable quantities of water (twin or multiple flushing cisterns E03D 1/22; flushing devices operated by pressure of the water supply system and discharging variable quantities of water E03D 3/12)
- 1/16 • • Cisterns for periodical discharge
- 1/18 • • Cisterns empty when not in action
- 1/20 • • Cisterns with tiltably-mounted containers
- 1/22 • • Twin or multiple flushing cisterns
- 1/24 • Low-level flushing systems
- 1/26 • • Bowl with flushing cistern mounted on the rearwardly extending end of the bowl (shape or material of the cistern E03D 1/01; constructional features of the bowl E03D 11/02-E03D 11/12)
- 1/28 • • Bowl integral with the flushing cistern
- 1/30 • Valves for high or low cisterns; Their arrangement (inlet valves, valves in general F16K)
- 1/32 • • Arrangement of inlet valves (devices for reducing noise E03D 9/14)
- 1/33 • • Adaptations or arrangements of floats (actuating-floats in general F16K 33/00)
- 1/34 • • Flushing valves for outlets; Arrangement of outlet valves
- 1/35 • • • Flushing valves having buoyancy [2]
- 1/36 • • Associated working of inlet and outlet valves
- 1/38 • Adaptations or arrangements of flushing pipes (noise-absorbing means in pipe systems F16L 55/00)
- 3/00 **Flushing devices operated by pressure of the water supply system**
- 3/02 • Self-closing flushing valves (self-closing valves in general F16K 21/04)
- 3/04 • • with piston valve and pressure chamber for retarding the valve-closing movement
- 3/06 • • with diaphragm valve and pressure chamber for retarding the valve-closing movement
- 3/08 • • with other retarding devices

E03D

- 3/10 • Flushing devices with pressure-operated reservoir, e.g. air chamber
- 3/12 • Flushing devices discharging variable quantities of water (flushing cisterns discharging variable quantities of water E03D 1/14)
- 5/00 Special constructions of flushing devices** (in motor vehicles or trailers B60R 15/00; in railway carriages B61D 35/00; in ships B63B 29/14; in aircraft B64D 11/02)
 - 5/01 • using flushing pumps
 - 5/012 • combined with movable closure elements in the bowl outlet (bowls with closure elements between bottom or outlet and outlet pipe E03D 11/10)
 - 5/014 • • with devices for separate removal of liquids and solids
 - 5/016 • with recirculation of bowl-cleaning fluid
 - 5/02 • operated mechanically or hydraulically (E03D 5/01, E03D 5/12 take precedence)
 - 5/04 • • directly by the seat or cover
 - 5/06 • • directly by the door
 - 5/08 • • directly by foot
 - 5/09 • • directly by hand
 - 5/092 • • • the flushing element, e.g. siphon bell, being actuated through a lever
 - 5/094 • • • the flushing element, e.g. siphon bell, being actuated through a cable, chain, or the like
 - 5/10 • operated electrically (E03D 5/01, E03D 5/12 take precedence)
 - 5/12 • discharging periodically (high-level cisterns for periodical discharge E03D 1/16)
- 7/00 Wheeled lavatories** (wheeled closets without flushing A47K 11/00; construction of land vehicles B62)
- 9/00 Sanitary or other accessories for lavatories** (hand tools for cleaning the toilet bowl A47K 11/10; seats or covers for closets A47K 13/00; body supports, other than seats, for closets A47K 17/02; devices for preventing contamination of drinking-water pipes E03C 1/10)
 - 9/02 • Devices adding a disinfecting, deodorising or cleaning agent to the water while flushing, or in the flushing tank (apparatus for disinfection of materials or objects in general A61L 2/00; treatment of water in general C02F)
 - 9/03 • • consisting of a separate container with an outlet through which the agent is introduced into the flushing water, e.g. by suction
- 9/04 • Special arrangement or operation of ventilating devices (ventilating rooms in general F24F)
- 9/05 • • ventilating the bowl
- 9/052 • • • using incorporated fans [2]
- 9/06 • Auxiliary chambers with water connection to the flushing pipe and adapted to receive utensils for bowl-cleaning, e.g. brushes
- 9/08 • Devices in the bowl producing upwardly-directed sprays; Modifications of the bowl for use with such devices (showers A47K 3/28; bathing devices for special therapeutic or hygienic purposes A61H 33/00, for specific parts of the body A61H 35/00)
- 9/10 • Waste-disintegrating apparatus combined with the bowl
- 9/12 • Means to prevent freezing of lavatories
- 9/14 • Noise-reducing means combined with flushing valves (noise-absorbing means in pipe systems F16L 55/00)
- 9/16 • Water pressure regulating means in flushing pipes
- 11/00 Other component parts of water-closets** (pipe joints or couplings in general F16L)
 - 11/02 • Water-closet bowls (auxiliary chambers with connections to flushing water for bowl-cleaning utensils E03D 9/06; modified for using upwardly-directed sprays E03D 9/08; seats or covers A47K 13/00)
 - 11/04 • • Bowls of flat shape with only slightly inclined bottom
 - 11/06 • • Bowls with downwardly-extending flanges
 - 11/08 • • Bowls with means producing a flushing water swirl
 - 11/10 • • Bowls with closure elements provided between bottom or outlet and the outlet pipe; Bowls with pivotally supported inserts
 - 11/11 • • Bowls combined with a reservoir, e.g. containing apparatus for disinfecting or for disintegrating
 - 11/12 • Swivel-mounted bowls, e.g. for use in restricted spaces
 - 11/13 • Parts or details of bowls; Special adaptations of pipe joints or couplings for use with bowls [2]
 - 11/14 • • Means for connecting the bowl to the wall, e.g. to a wall outlet [2]
 - 11/16 • • Means for connecting the bowl to the floor, e.g. to a floor outlet [2]
 - 11/17 • • Means for connecting the bowl to the flushing pipe [2]
 - 11/18 • Siphons (for pipes in general F16L 43/00, F16L 45/00)
- 13/00 Urinals** (without flushing devices A47K 11/00)

E03F SEWERS; CESSPOOLS

Subclass index

SEWERS..... 1/00-9/00
CESSPOOLS..... 11/00, 7/00

- 1/00 Methods, systems, or installations for draining-off sewage or storm water**
- 3/00 Sewer pipe-line systems**
 - 3/02 • Arrangement of sewer pipe-lines or pipe-line systems
 - 3/04 • Pipes or fittings specially adapted to sewers (manufacture of concrete tubes B28; pipes or pipe fittings in general F16L)
 - 3/06 • Methods of, or installations for, laying sewer pipes (making pipes in situ F16L 1/038) [6]

5/00 Sewerage structures

- 5/02 • Manhole shafts or other inspection chambers (in general E02D 29/12); Snow-filling openings; Accessories (covers or frames for manholes or the like E02D 29/14)
- 5/04 • Gullies with or without odour seals or sediment traps
- 5/042 • • Arrangements of means against overflow of water, backing-up from the drain
- 5/046 • • adapted to be used with kerbs (E03F 5/06 takes precedence)
- 5/06 • • Gully gratings
- 5/08 • Ventilation of sewers
- 5/10 • Collecting-tanks; Equalising-tanks for regulating the run-off; Laying-up basins
- 5/12 • Emergency outlets
- 5/14 • Devices for separating liquid or solid substances from sewage, e.g. sand or sludge traps, rakes or grates (for use in sewage purification plants or both in sewage purification plants or in sewer systems B01D, C02F)
- 5/16 • • Devices for separating oil, water, or grease from sewage in drains leading to the main sewer
- 5/18 • Tanks for disinfecting, neutralising, or cooling sewage (arrangements in tanks as to the biological or chemical aspect C02F)
- 5/20 • Siphon pipes or inverted siphons (for connections of baths, basins, or the like E03C 1/12)

- 5/22 • Adaptations of pumping plants for lifting sewage (wheeled apparatus for emptying sewers or cesspools E03F 7/10; pumps, pumping plants, *per se* F04)
- 5/24 • Installations for neutralising explosions in sewers
- 5/26 • Installations for stirring-up sewage

7/00 Other installations or implements for operating sewer systems, e.g. for preventing or indicating stoppage; Emptying cesspools

- 7/02 • Shut-off devices (in general F16K)
- 7/04 • • Valves for preventing return flow
- 7/06 • Devices for restraining rats or other animals
- 7/08 • Hand implements for emptying sewers or cesspools
- 7/10 • Wheeled apparatus for emptying sewers or cesspools
- 7/12 • Installations enabling inspection personnel to drive along sewer canals

9/00 Arrangements or fixed installations for cleaning sewer pipes, e.g. by flushing (sediment traps, rakes, screens, or the like, arranged in sewer lines E03F 5/14; cleaning pipes in general, devices for cleaning pipes B08B 9/02)**11/00 Cesspools** (emptying cesspools E03F 7/00; features relating to treatment of sewage C02F)**E04 BUILDING****E04B GENERAL BUILDING CONSTRUCTIONS; WALLS, e.g. PARTITIONS; ROOFS; FLOORS; CEILINGS; INSULATION OR OTHER PROTECTION OF BUILDINGS** (border constructions of openings in walls, floors, or ceilings E06B 1/00)**Note(s)**

1. This subclass covers working methods used in constructing new buildings and analogous working methods on existing buildings. Other working methods on existing buildings, except those for insulating, are classified in group E04G 23/00.
2. In this subclass, the following term is used with the meaning indicated:
 - "ceiling" includes all the finishing material concealing the underside of the load-carrying ceiling structure or roof structure.

1/00 Constructions in general; Structures which are not restricted either to walls, e.g. partitions, or floors or ceilings or roofs (scaffolds, shutterings E04G; structures specially adapted for buildings for special purposes, general layout of buildings, e.g. modular co-ordination, E04H; the particular parts of buildings, see the relevant groups for those parts)

- 1/02 • Structures consisting primarily of load-supporting, block-shaped or slab-shaped elements (E04B 1/32-E04B 1/36 take precedence)
- 1/04 • • the elements consisting of concrete, e.g. reinforced concrete, or other stone-like material
- 1/06 • • • the elements being prestressed
- 1/08 • • the elements consisting of metal
- 1/10 • • the elements consisting of wood
- 1/12 • • the elements consisting of other material
- 1/14 • • the elements being composed of two or more materials (of reinforced concrete E04B 1/04)
- 1/16 • Structures made from masses, e.g. concrete, cast or similarly formed in situ with or without making use of additional elements, such as permanent forms, sub-structures to be coated with load-bearing material (E04B 1/32-E04B 1/36 take precedence)

- 1/18 • Structures comprising elongated load-supporting parts, e.g. columns, girders, skeletons (E04B 1/32-E04B 1/36 take precedence; elongated load-supporting parts as elements, trusses, truss-like structures E04C 3/00)

- 1/19 • • Three-dimensional framework structures [2]

Note(s)

Group E04B 1/19 takes precedence over groups E04B 1/20-E04B 1/30.

- 1/20 • • the supporting parts consisting of concrete, e.g. reinforced concrete, or other stone-like material
- 1/21 • • • Connections specially adapted therefor [2]
- 1/22 • • • with parts being prestressed
- 1/24 • • the supporting parts consisting of metal
- 1/26 • • the supporting parts consisting of wood
- 1/28 • • the supporting parts consisting of other material
- 1/30 • • the supporting parts being composed of two or more materials; Composite steel and concrete constructions (of reinforced concrete E04B 1/20)
- 1/32 • Arched structures; Vaulted structures; Folded structures (vaulted roofs E04B 7/08)

- 1/34 • Extraordinary structures, e.g. with suspended or cantilever parts supported by masts or tower-like structures enclosing elevators or stairs; Features relating to the elastic stability (E04B 1/342, E04B 1/343, E04B 1/348 take precedence; for floors E04B 5/43; buildings for special purposes, e.g. withstanding earthquake, E04H)
- 1/342 • Structures covering a large free area, whether open-sided or not, e.g. hangars, halls (roof trusses E04C 3/00; non-structural features for specified purposes, see the relevant groups of E04H)
- 1/343 • Structures characterised by movable, separable, or collapsible parts, e.g. for transport (movable roof parts E04B 7/16; floatable buildings B63B; small prefabricated buildings, transportable as a whole, E04H 1/12; small garages E04H 6/02; tents or canopies, in general E04H 15/00)
- 1/344 • • with hinged parts
- 1/346 • • Rotary buildings; Buildings with rotary units, e.g. rooms
- 1/348 • Structures composed of units comprising at least considerable parts of two sides of a room, e.g. box-like or cell-like units closed or in skeleton form (wall units locating conduits or the like E04C 2/52)
- 1/35 • Extraordinary methods of construction, e.g. lift-slab, jack-block (E04B 1/34 takes precedence; falsework, shuttering for shaping walls, floors, ceilings or roofs for structures of particular shape in situ E04G 11/04; conveying or assembling of building materials E04G 21/00; working measures on existing buildings E04G 23/00)
- 1/36 • Bearings or like supports allowing movement (for bridges E01D 19/04; buildings withstanding earthquake E04H 9/02)
- 1/38 • Connections for building structures in general

Note(s)

Connections specially adapted for particular building parts or for particular building structures are classified in the groups for those parts or structures, e.g. in groups E04B 1/21, E04B 2/00, E04B 5/00, E04B 7/00 or E04B 9/00. Joints not specially adapted for building construction, or of more general application, are classified in the appropriate subclasses, e.g. F16B.

- 1/41 • • Connecting devices specially adapted for embedding in concrete or masonry (spacers for cavity walls E04B 2/30, E04B 2/44; connectors for reinforcing elements E04C 5/16; fastening frames to the border of openings E06B 1/56)
- 1/48 • • Dowels, i.e. members adapted to penetrate the surfaces of two parts and to take the shear stresses
- 1/49 • • • with self-penetrating parts, e.g. claw dowels
- 1/58 • • of bar-shaped building elements
- 1/61 • • of slab-shaped building elements with each other [5]
- 1/62 • Insulation or other protection; Elements or use of specified material therefor (chemical compositions C01-C11; implements for applying insulation or sealings E04F 21/00; buildings to withstand, or to provide protection against, external undesired influences E04H 9/00; sealing pipes in walls or partitions F16L 5/02; shielding against dangerous radiation G21F; constructions of particular parts of buildings, see the relevant groups for those parts)
- 1/64 • • for making damp-proof; Protection against corrosion (sealings E04B 1/66)

- 1/66 • • Sealings (additions of anti-leak properties to plaster C04B; bituminous sealing masses C08L 95/00; sealings for hydraulic engineering work in general E02B 3/16; against ground humidity or ground water E02D 31/02; coverings against rain or other precipitations of the atmosphere E04D; composition of material or manufacture of sealing foils, see the relevant classes for these foils)
- 1/68 • • • of joints, e.g. expansion joints (packing for joints in roads or airfields E01C 11/02; expansion joints for bridges E01D 19/06; sealing joints between foundation piles E02D 5/14; joints in foundation structures E02D 29/16; devices for sealing the spaces or joints between roof-covering elements E04D 1/36; sealing joints between roof-covering elements E04D 3/38; construction of joints for flooring or floor layers made of masses in situ E04F 15/14)
- 1/682 • • • • formed in situ [5]
- 1/684 • • • • using preformed elastomeric elements [5]
- 1/686 • • • • comprising a plurality of hollow, deformable internal cells [5]
- 1/70 • • Drying or keeping dry, e.g. by air vents (by sealings E04B 1/66; during erection E04G 21/28)
- 1/72 • • Pest control (by keeping dry E04B 1/70; impregnation of wood or like materials B27K)
- 1/74 • • Heat, sound or noise insulation, absorption, or reflection (forms of, or arrangements in, rooms for influencing or directing sound E04B 1/99); Other building methods affording favourable thermal or acoustical conditions, e.g. accumulating of heat within walls (fire protection E04B 1/94; elements chiefly adapted for structural purposes E04C 1/00-E04C 3/00; chiefly adapted for surface coverings E04F 13/00; as underlayers for floor coverings E04F 15/18; closures for wall or like openings E06B)
- 1/76 • • • specifically with respect to heat only (heat insulation in general F16L 59/00)
- 1/78 • • • • Heat insulating elements
- 1/80 • • • • • slab-shaped
- 1/82 • • • specifically with respect to sound only (noise damping in ducts or channels E04F 17/00; noise damping in general G10K 11/16)
- 1/84 • • • • Sound-absorbing elements
- 1/86 • • • • • slab-shaped
- 1/88 • • • Insulating elements for both heat and sound
- 1/90 • • • • slab-shaped
- 1/92 • • Protection against other undesired influences or dangers (buildings providing protection against external dangers E04H 9/00; shielding against dangerous radiation G21F)
- 1/94 • • • against fire (fire-fighting A62C; impregnation of wood or similar materials B27K; fireproof doors E06B 5/16)
- 1/98 • • • against vibrations or shocks (on foundations E02D 31/08); against mechanical destruction, e.g. by air-raids (against incendiary damage only E04B 1/94; finishing work therefor E04F; buildings withstanding earthquake or the like, shelters, arrangements of splinter-catching walls E04H 9/00)

- 1/99 • Room acoustics, i.e. forms of, or arrangements in, rooms for influencing or directing sound (E04B 1/82 takes precedence; acoustics in general G10K 11/00; electric signal processing for producing a reverberation or echo sound G10K 15/08)
- 2/00 Walls, e.g. partitions, for buildings; Wall construction with regard to insulation; Connections specially adapted to walls** (connections for building structures in general E04B 1/38; insulation for building in general E04B 1/62; building elements of relatively thin form for parts of buildings E04C 2/00)
- 2/02 • built-up from layers of building elements
- 2/04 • • Walls having neither cavities between, nor in, the solid elements
- 2/06 • • • using elements having specially-designed means for stabilising the position
- 2/08 • • • • by interlocking of projections or inserts with indentations, e.g. of tongues, grooves, dovetails
- 2/10 • • • • by filling material with or without reinforcements in small channels in, or in grooves between, the elements
- 2/12 • • • using elements having a general shape differing from that of a parallelepiped
- 2/14 • • Walls having cavities in, but not between, the elements, i.e. each cavity being enclosed by at least four sides forming part of one single element
- 2/16 • • • using elements having specially designed means for stabilising the position
- 2/18 • • • • by interlocking of projections or inserts with indentations, e.g. of tongues, grooves, dovetails
- 2/20 • • • • by filling material with or without reinforcements in small channels in, or in grooves between, the elements
- 2/22 • • • using elements having a general shape differing from that of a parallelepiped
- 2/24 • • • the walls being characterised by fillings in some of the cavities forming load-bearing pillars or beams
- 2/26 • • • the walls being characterised by fillings in all cavities in order to form a wall construction
- 2/28 • • Walls having cavities between, but not in, the elements; Walls of elements each consisting of two or more parts kept in distance by means of spacers, all parts being solid
- 2/30 • • • using elements having specially designed means for stabilising the position; Spacers for cavity walls
- 2/32 • • • • by interlocking of projections or inserts with indentations, e.g. of tongues, grooves, dovetails
- 2/34 • • • • by filling material with or without reinforcements in small channels in, or in grooves between, the elements
- 2/36 • • • using elements having a general shape differing from that of a parallelepiped
- 2/38 • • • the walls being characterised by fillings in some of the cavities forming load-bearing pillars or beams
- 2/40 • • • the walls being characterised by fillings in all cavities in order to form a wall construction
- 2/42 • • Walls having cavities between, as well as in, the elements; Walls of elements each consisting of two or more parts, kept in distance by means of spacers, at least one of the parts having cavities
- 2/44 • • • using elements having specially designed means for stabilising the position; Spacers for cavity walls
- 2/46 • • • • by interlocking of projections or inserts with indentations, e.g. of tongues, grooves, dovetails
- 2/48 • • • • by filling material with or without reinforcements in small channels in, or in grooves between, the elements
- 2/50 • • • using elements having a general shape differing from that of a parallelepiped
- 2/52 • • • the walls being characterised by fillings in some of the cavities forming load-bearing pillars or beams
- 2/54 • • • the walls being characterised by fillings in all cavities in order to form a wall construction
- 2/56 • Walls of framework or pillarwork; Walls incorporating load-bearing elongated members (E04B 2/74, E04B 2/88 take precedence; pillars E04C 3/30)
- 2/58 • • with elongated members of metal
- 2/60 • • • characterised by special cross-section of the elongated members
- 2/62 • • • • the members being formed of two or more elements in side-by-side relationship
- 2/64 • • with elongated members of concrete
- 2/66 • • • characterised by special cross-section of the elongated members
- 2/68 • • • made by filling-up wall cavities (E04B 2/24, E04B 2/38, E04B 2/52 take precedence)
- 2/70 • • with elongated members of wood
- 2/72 • Walls of elements of relatively thin form (E04B 2/56, E04B 2/74, E04B 2/88 take precedence; with joint fillings acting as framework or pillars E04B 2/68; elements E04C 2/00)
- 2/74 • Removable non-load-bearing partitions; Partitions with a free upper edge (framed panels E04C 2/38)
- 2/76 • • with framework or posts of metal
- 2/78 • • • characterised by special cross-section of the frame members
- 2/80 • • with framework or posts of wood
- 2/82 • • characterised by the manner in which edges are connected to the building; Means therefor; Special details of easily-removable partitions
- 2/84 • Walls made by casting, pouring, or tamping in situ (E04B 2/02, E04B 2/56 take precedence; forms therefor E04G 11/06; working of concrete or similar masses able to be cast or poured in situ E04G 21/02)
- 2/86 • • made in permanent forms
- 2/88 • Curtain walls
- 2/90 • • comprising panels directly attached to the structure [4]
- 2/92 • • • Sandwich-type panels [4]
- 2/94 • • • Concrete panels (E04B 2/92 takes precedence) [4]
- 2/96 • • comprising panels attached to the structure through mullions or transoms [4]
- 5/00 Floors; Floor construction with regard to insulation; Connections specially adapted therefor** (elements for floors, e.g. bricks, stones, filling bodies, girders, E04C; flooring as finishing work, insulation of flooring, sectional false floors, e.g. for computers, E04F 15/00) [5]
- 5/02 • Load-carrying floor structures formed substantially of prefabricated units (E04B 5/43-E04B 5/48 take precedence)

E04B

- 5/04 • • with beams of concrete or other stone-like material, e.g. asbestos cement (E04B 5/08, E04B 5/14 take precedence)
- 5/06 • • • placed against one another
- 5/08 • • assembled of block-shaped elements, e.g. hollow stones (E04B 5/14 takes precedence; floors composed of reinforced brickwork E04B 5/44)
- 5/10 • • with metal beams or girders, e.g. with steel lattice girders (E04B 5/14 takes precedence)
- 5/12 • • with wooden beams (E04B 5/14 takes precedence)
- 5/14 • • with beams or girders laid in two directions
- 5/16 • Load-carrying floor structures wholly or partly cast or similarly formed in situ (E04B 5/43-E04B 5/48 take precedence; floors merely characterised by the prefabricated elements E04C)
- 5/17 • • Floor structures partly formed in situ
- 5/18 • • • with stiffening ribs or other beam-like formations wholly cast between filling members
- 5/19 • • • • the filling members acting as self-supporting permanent forms (E04B 5/21 takes precedence)
- 5/21 • • • • Cross-ribbed floors
- 5/23 • • • with stiffening ribs or other beam-like formations wholly or partly prefabricated (with all load-carrying parts substantially consisting of prefabricated units E04B 5/02)
- 5/26 • • • • with filling members between the beams (E04B 5/28 takes precedence)
- 5/28 • • • • Cross-ribbed floors
- 5/29 • • • • the prefabricated parts of the beams consisting wholly of metal (E04B 5/28 takes precedence)
- 5/32 • • Floor structures wholly cast in situ with or without form units or reinforcements
- 5/36 • • • with form units as part of the floor
- 5/38 • • • • with slab-shaped form units acting simultaneously as reinforcement; Form slabs with reinforcements extending laterally outside the element
- 5/40 • • • • with metal form slabs
- 5/43 • Floor structures of extraordinary design; Features relating to the elastic stability; Floor structures specially designed for resting on columns only, e.g. mushroom floors (extraordinary constructions in general E04B 1/34)
- 5/44 • Floors composed of stones, mortar, and reinforcing elements (with inserts of glass E04B 5/46)
- 5/46 • Special adaptation of floors for transmission of light, e.g. by inserts of glass (of ceilings E04B 9/32; block-shaped elements E04C 1/42; slab- or sheet-shaped elements E04C 2/54; for roof covering E04D 3/06) [5]
- 5/48 • Special adaptations of floors for incorporating ducts, e.g. for heating or ventilating (in block-shaped elements E04C 1/39; in slab- or sheet-shaped elements E04C 2/52)
- 7/00 Roofs; Roof construction with regard to insulation** (structures for roofs as well as for floors E04B 5/00; ceilings E04B 9/00; greenhouses A01G 9/14; large containers having floating covers B65D 88/34; roof trusses, truss-like structures, joists E04C 3/02; roof coverings E04D) [5]
- 7/02 • with plane sloping surfaces, e.g. saddle roofs (E04B 7/12 takes precedence)
- 7/04 • • supported by horizontal beams or the equivalent resting on the walls (E04B 7/06 takes precedence)
- 7/06 • • Constructions of roof intersections or hopped ends
- 7/08 • Vaulted roofs (E04B 7/14 takes precedence; vaulted structures in general E04B 1/32; inflatable tents or canopies, in general E04H 15/20; inflatable forms for shaping in situ E04G 11/04)
- 7/10 • • Shell structures, e.g. of hyperbolic-parabolic shape; Grid-like formations acting as shell structures; Folded structures
- 7/12 • formed in bays, e.g. sawtooth roofs (E04B 7/10 takes precedence)
- 7/14 • Suspended roofs (suspended tents or canopies, in general E04H 15/04)
- 7/16 • Roof structures with movable roof parts (buildings for special purposes E04H)
- 7/18 • Special structures in or on roofs, e.g. dormer windows (in connection with roof coverings E04D 13/00, especially domes E04D 13/03)
- 7/20 • Roofs consisting of self-supporting slabs, e.g. able to be loaded [5]
- 7/22 • • the slabs having insulating properties, e.g. being laminated with layers of insulating material (E04B 7/24 takes precedence) [6]
- 7/24 • • the slabs being collapsible, e.g. for transport [6]
- 9/00 Ceilings; Construction of ceilings, e.g. false ceilings; Ceiling construction with regard to insulation** (ceilings used as forms for making floors E04B 5/00; coverings or linings for ceilings E04F 13/00) [5]
- 9/02 • having means for ventilation or vapour discharge [5]
- 9/04 • comprising slabs, sheets or the like (E04B 9/06-E04B 9/34 take precedence; slabs, sheets or the like per se E04C 2/00) [5]
- 9/06 • characterised by constructional features of the supporting construction [5]
- 9/08 • • having the capability of expansion [5]
- 9/10 • • Connections between parallel members of the supporting construction (E04B 9/08 takes precedence) [5]
- 9/12 • • Connections between non-parallel members of the supporting construction (E04B 9/08 takes precedence) [5]
- 9/14 • • • all the members being discontinuous and lying at least partly in the same plane [5]
- 9/16 • • • the members lying in different planes [5]
- 9/18 • Means for suspending the supporting construction [5]
- 9/20 • • adjustable [5]
- 9/22 • Connection of slabs, sheets or the like to the supporting construction [5]
- 9/24 • • with the slabs, sheets or the like positioned on, or held against, horizontal flanges of the supporting construction [5]
- 9/26 • • • by means of snap action of elastically deformable elements [5]
- 9/28 • • with the slabs, sheets or the like having grooves engaging with horizontal flanges of the supporting construction or accessory means connected thereto [5]
- 9/30 • characterised by edge details of the ceiling, e.g. securing to an adjacent wall [5]
- 9/32 • Translucent ceilings, i.e. permitting both the transmission and diffusion of light (E04B 9/34 takes precedence; lighting F21) [5]
- 9/34 • Open-work ceilings, e.g. lattice type (E04B 9/30 takes precedence) [5]
- 9/36 • • consisting of parallel slats [5]

E04C	STRUCTURAL ELEMENTS; BUILDING MATERIALS (for bridges E01D; specially designed for insulation or other protection E04B; elements used as building aids E04G; for mining E21; for tunnels E21D; structural elements with broader range of application than for building engineering F16, particularly F16S)		
1/00	Building elements of block or other shape for the construction of parts of buildings (of relatively thin form E04C 2/00; structural elongated elements designed for load-supporting E04C 3/00, e.g. columns or pillars E04C 3/30; manufacture or material of building bricks, stones, or the like B28, C03, C04; paving elements E01C; general building constructions E04B, e.g. walls E04B 2/00, floors E04B 5/00, roofs E04B 7/00, ceilings E04B 9/00; structural elements specially designed for built-in conduit shafts E04F; special elements for building ovens or furnaces F24B, F27D) [5]		
1/39	• characterised by special adaptations, e.g. serving for locating conduits, for forming soffits, cornices, or shelves, for fixing wall-plates or door-frames, for claustra	2/292	• • • composed of insulating material and sheet metal [6]
1/40	• built-up from parts of different materials, e.g. composed of layers of different materials or stones with filling material or with insulating inserts	2/296	• • • composed of insulating material and non-metallic or unspecified sheet-material (E04C 2/288 takes precedence) [6]
1/41	• • composed of insulating material and load-bearing concrete, stone or stone-like material [6]	2/30	• characterised by the shape or structure (translucent E04C 2/54)
1/42	• of glass or other transparent material	2/32	• • formed of corrugated or otherwise indented sheet-like material; composed of such layers with or without layers of flat sheet-like material
2/00	Building elements of relatively thin form for the construction of parts of buildings, e.g. sheet materials, slabs, or panels (materials or manufacture, <u>see</u> the relevant places, e.g. B27N, B29, D21J; made <u>in situ</u> E04B; specially designed for insulation or other protection E04B 1/62; load-carrying floor structures E04B 5/02, E04B 5/16; roofs consisting of self-supporting slabs E04B 7/20; roof- or like covering elements E04D 3/00; for lining or finishing E04F 13/00)		
2/02	• characterised by specified materials (translucent E04C 2/54)	2/34	• • composed of two or more spaced sheet-like parts (E04C 2/32 takes precedence; spacers for cavity walls E04B 2/44)
2/04	• • of concrete or other stone-like material; of asbestos cement (E04C 2/26 takes precedence; material or manufacture B28, C04)	2/36	• • • spaced apart by transversely-placed strip material, e.g. honeycomb panels (honeycomb or other core members for layered products B32B)
2/06	• • • reinforced	2/38	• • with attached ribs, flanges, or the like, e.g. framed panels (concerned with attaching to other panels or elements to form a structure, <u>see</u> the places for the relevant structure, e.g. E04B 2/00)
2/08	• • of metal, e.g. sheet metal (E04C 2/26 takes precedence)	2/40	• • composed of a number of smaller components rigidly or movably connected together, e.g. interlocking, hingedly connected
2/10	• • of wood, fibres, chips, vegetable stems, or the like; of plastics; of foamed products (E04C 2/26 takes precedence)	2/42	• • Gratings; Grid-like panels (reinforcing elements E04C 5/00; built-in gratings E04F 19/10; gratings in general F16S 3/00)
2/12	• • • of solid wood	2/52	• • with special adaptations for auxiliary purposes, e.g. serving for locating conduits (E04C 2/54 takes precedence; block-shaped elements therefor E04C 1/39; floor structures incorporating ducts E04B 5/48)
2/14	• • • reinforced	2/54	• Slab-like translucent elements (floors for transmitting light E04B 5/46; translucent or open-work ceilings E04B 9/32, E04B 9/34; translucent roof coverings E04D 3/06, E04D 3/28)
2/16	• • • of fibres, chips, vegetable stems, or the like	3/00	Structural elongated elements designed for load-supporting (as building aids E04G)
2/18	• • • with binding wires, reinforcing bars, or the like	3/02	• Joists; Girders, trusses, or truss-like structures, e.g. prefabricated; Lintels; Transoms (E04C 3/38 takes precedence; for structures characterised by movable, separable, or collapsible parts E04B 1/343)
2/20	• • • of plastics	3/04	• • of metal (E04C 3/29 takes precedence; as reinforcing elements E04C 5/06; manufacture B21)
2/22	• • • reinforced	3/06	• • • with substantially solid, i.e. unapertured, web (E04C 3/10, E04C 3/11 take precedence)
2/24	• • • laminated and composed of materials covered by two or more of groups E04C 2/12, E04C 2/16, E04C 2/20	3/07	• • • at least partly of bent or otherwise deformed strip- or sheet-like material
2/26	• • composed of materials covered by two or more of groups E04C 2/04, E04C 2/08, E04C 2/10, or of materials covered by one of these groups with a material not specified in one of these groups	3/08	• • • with apertured web, e.g. with a web consisting of bar-like components; Honeycomb girders (E04C 3/10, E04C 3/11 take precedence)
2/28	• • • combinations of materials fully covered by groups E04C 2/04 and E04C 2/08	3/09	• • • at least partly of bent or otherwise deformed strip- or sheet-like material
2/284	• • • at least one of the materials being insulating [6]	3/10	• • • prestressed
2/288	• • • composed of insulating material and concrete, stone or stone-like material [6]	3/11	• • • with non-parallel upper and lower edges, e.g. roof trusses (arched girders, portal frames E04C 3/38)
		3/12	• • of wood, e.g. with reinforcements, with tensioning members (E04C 3/292 takes precedence)

E04C

- 3/14 • • • with substantially solid, i.e. unapertured, web (E04C 3/17, E04C 3/18 take precedence)
- 3/16 • • • with apertured web, e.g. trusses (E04C 3/17, E04C 3/18 take precedence)
- 3/17 • • • with non-parallel upper and lower edges, e.g. roof trusses
- 3/18 • • • with metal reinforcements or tensioning members
- 3/20 • • • of concrete or other stone-like material, e.g. with reinforcements or tensioning members (reinforcing elements E04C 5/00)
- 3/22 • • • built-up by elements joined in line
- 3/26 • • • prestressed (E04C 3/22, E04C 3/29 take precedence; prestressing members E04C 5/08)
- 3/28 • • • of other materials
- 3/29 • • • built-up from parts of different materials
- 3/292 • • • the materials being wood and metal
- 3/293 • • • the materials being steel and concrete (concrete with internal reinforcements or tensioning members E04C 3/20)
- 3/294 • • • • of concrete combined with a girder-like structure extending laterally outside the element (light-weight girders used as reinforcement E04C 5/065; as part of a floor structure E04B 5/23)
- 3/30 • Columns; Pillars; Struts (not designed for end loading E04C 3/02; posts, masts, as independent structures E04H 12/00)
- 3/32 • • • of metal (E04C 3/36 takes precedence)
- 3/34 • • • of concrete or other stone-like material, with or without permanent form elements, with or without internal or external reinforcement, e.g. metal coverings (E04C 3/36 takes precedence)
- 3/36 • • • of other materials
- 3/38 • Arched girders or portal frames (straight girders able to be bent E04C 3/02; inflatable tents or canopies, in general E04H 15/20)
- 3/40 • • • of metal (E04C 3/46 takes precedence)
- 3/42 • • • of wood, e.g. units for rafter roofs (E04C 3/46 takes precedence)
- 3/44 • • • of concrete or other stone-like material, e.g. with reinforcements or tensioning members (E04C 3/46 takes precedence)
- 3/46 • • • of other materials
- 5/00 Reinforcing elements, e.g. for concrete; Auxiliary elements therefor** (material composition C21, C22; arrangements of reinforcing elements, see the relevant classes)
- 5/01 • Reinforcing elements of metal, e.g. with non-structural coatings **[5]**
- 5/02 • • • of low bending resistance, i.e. of essentially one-or two-dimensional extent
- 5/03 • • • with indentations, projections, ribs, or the like, for augmenting the adherence to the concrete
- 5/04 • • • Mats (bases for plaster E04F 13/04)
- 5/06 • • • of high bending resistance, i.e. of essentially three-dimensional extent, e.g. lattice girders
- 5/065 • • • Light-weight girders, e.g. with precast parts (light-weight girders in general E04C 3/08, E04C 3/294)
- 5/07 • Reinforcing elements of material other than metal, e.g. of glass, of plastics, or not exclusively made of metal (metal elements with non-structural coatings E04C 5/01) **[5]**
- 5/08 • Members specially adapted to be used in prestressed constructions
- 5/10 • • Ducts
- 5/12 • Anchoring devices (tools or methods for tensioning E04G 21/12) **[5]**
- 5/16 • Auxiliary parts for reinforcements, e.g. connectors, spacers, stirrups (tools for connecting reinforcing elements E04G 21/12)
- 5/18 • • • of metal or substantially of metal
- 5/20 • • • of other material than metal or with only additional metal parts, e.g. concrete or plastics spacers with metal binding wires

E04D ROOF COVERINGS; SKY-LIGHTS; GUTTERS; ROOF-WORKING TOOLS (coverings of outer walls by plaster or other porous material E04F 13/00)

Note(s)

In this subclass, the following expression is used with the meaning indicated:

- "roof coverings" includes any similar kind of watertight covering against rain, snow, hail, or the like, for other parts of buildings.

Subclass index

ROOF COVERINGS

- Tiles or slates; slabs or stiff sheets; flexible materials..... 1/00, 3/00, 5/00, 11/00
- Bulk materials, straw or thatch..... 7/00, 9/00, 11/00
- Other materials..... 11/00

SPECIAL ARRANGEMENTS IN CONNECTION WITH ROOF COVERINGS..... 12/00, 13/00

APPARATUS OR TOOLS FOR ROOF WORKING..... 15/00

-
- 1/00 Roof covering by making use of tiles, slates, shingles, or other small roofing elements** (roofing supports E04D 12/00)
 - 1/02 • Grooved or vaulted roofing elements (E04D 1/28, E04D 1/30 take precedence)
 - 1/04 • • • of ceramics, glass or concrete, with or without reinforcement
 - 1/06 • • • of metal
 - 1/08 • • • of plastics; of fibrous materials
 - 1/10 • • • of specified materials, or of combinations of materials, not covered by any one of groups E04D 1/04-E04D 1/08

- 1/12 • Roofing elements shaped as plain tiles or shingles, i.e. with flat outer surface (E04D 1/28, E04D 1/30 take precedence)
- 1/14 • • of slate material, with or without fastening means
- 1/16 • • of ceramics, glass or concrete, with or without reinforcement
- 1/18 • • of metal
- 1/20 • • of plastics, fibrous materials, or wood
- 1/22 • • of specified materials, or of combinations of materials, not covered by any one of groups E04D 1/14-E04D 1/20
- 1/24 • Roofing elements with cavities, e.g. hollow tiles (E04D 1/28 takes precedence)
- 1/26 • Strip-shaped roofing elements appearing as a row of shingles
- 1/28 • Roofing elements comprising two or more layers, e.g. for insulation
- 1/30 • Special roof-covering elements, e.g. ridge tiles, gutter tiles, gable tiles, ventilation tiles (E04D 3/40 takes precedence; roof covering aspects of energy collecting devices E04D 13/18)
- 1/34 • Fastenings for attaching roof-covering elements to the supporting elements
- 1/36 • Devices for sealing the spaces or joints between roof-covering elements (sealing joints not restricted to roof covering elements E04B 1/68)

3/00 Roof covering by making use of flat or curved slabs or stiff sheets (E04D 1/00 takes precedence; built-up roofs E04D 11/02)

- 3/02 • of plane slabs, slates, or sheets, or in which the cross-section is unimportant (E04D 3/35 takes precedence)
- 3/04 • • of concrete or ceramics (of asbestos cement E04D 3/18)
- 3/06 • • of glass or other translucent material; Fixing means therefor (fixing glass panes by means applicable to windows E06B 3/54)
- 3/08 • • • with metal glazing bars
- 3/14 • • • with glazing bars of other material, e.g. of glass
- 3/16 • • of metal
- 3/18 • • of specified materials, or of combinations of materials, not covered by any of groups E04D 3/04, E04D 3/06 or E04D 3/16
- 3/24 • with special cross-section, e.g. with corrugations on both sides, with ribs, flanges, or the like (E04D 3/35 takes precedence)
- 3/26 • • of concrete or ceramics
- 3/28 • • of glass
- 3/30 • • of metal
- 3/32 • • of plastics, fibrous materials, or asbestos cement
- 3/34 • • of specified materials, or of combinations of materials, not covered by any one of groups E04D 3/26-E04D 3/32
- 3/35 • Roofing slabs or stiff sheets comprising two or more layers, e.g. for insulation
- 3/36 • Connecting; Fastening

Note(s)

In groups E04D 3/361-E04D 3/368, additional small fastening elements, e.g. nails, screws, are not to be considered to be separate connecting elements.

- 3/361 • • by specially-profiled marginal portions of the slabs or sheets
- 3/362 • • • by locking the edge of one slab or sheet within the profiled marginal portion of the adjacent slab or sheet, e.g. using separate connecting elements

- 3/363 • • • with snap action [4]
- 3/3645 • • • by interference fitting [4]
- 3/365 • • by simple overlapping of the marginal portions with use of separate connecting elements, e.g. hooks or bolts for corrugated sheets
- 3/366 • • by closing the space between the slabs or sheets by gutters, bulges, or bridging elements, e.g. strips
- 3/367 • • by permanent deformation of the marginal portions of adjacent slabs or sheets, e.g. by folding the edges [4]
- 3/368 • • by forcing together the marginal portions of adjacent slabs or sheets
- 3/369 • • by welding of the marginal portions of adjacent slabs or sheets
- 3/38 • Devices for sealing spaces or joints between roof-covering elements (E04D 3/36 takes precedence; sealing joints not restricted to roof covering elements E04B 1/68)
- 3/40 • Slabs or sheets locally modified for auxiliary purposes, e.g. for resting on walls, for serving as guttering; Elements for particular purposes, e.g. ridge elements, specially designed for use in conjunction with slabs or sheets (roof covering aspects of energy collecting devices E04D 13/18)

5/00 Roof covering by making use of flexible material, e.g. supplied in roll form (using stiff sheets E04D 3/00; gravelling of flat roofs E04D 7/00; built-up roofs E04D 11/02)

Note(s)

Group E04D 5/12 takes precedence over groups E04D 5/02-E04D 5/08.

- 5/02 • of materials impregnated with sealing substances, e.g. roofing felt
- 5/04 • by making use of metal foils
- 5/06 • by making use of plastics
- 5/08 • by making use of other materials
- 5/10 • by making use of compounded or laminated materials, e.g. metal foils or plastic films coated with bitumen (E04D 5/12 takes precedence)
- 5/12 • specially modified, e.g. perforated, with granulated surface, with attached pads
- 5/14 • Fastening means therefor

7/00 Roof covering by sealing masses applied in situ; Gravelling of flat roofs

9/00 Roof covering by using straw, thatch, or like materials (impregnation against incendiary damage B27K)

11/00 Roof covering, as far as not restricted to features covered by only one of groups E04D 1/00-E04D 9/00; Roof covering in ways not provided for by groups E04D 1/00-E04D 9/00

- 11/02 • Built-up roofs, i.e. consisting of two or more layers bonded together in situ, at least one of the layers being of watertight composition (gravelling of flat roofs E04D 7/00; venting or ventilation E04D 13/17)

12/00 Non-structural supports for roofing materials, e.g. battens, boards (E04D 11/02 takes precedence)

13/00 Special arrangements or devices in connection with roof coverings; Roof drainage (ventilation tiles E04D 1/30; ventilation slabs E04D 3/40; internal channels E04F 17/00; roofing elements therefor, see the relevant groups)

E04D

- 13/02 • Roof-covering aspects of dormer windows (E04D 13/14 takes precedence; structures therefor E04B 7/18)
- 13/03 • Sky-lights; Domes; Ventilating sky-lights (E04D 13/14 takes precedence; structures therefor E04B 7/18)
- 13/035 • • characterised by having movable parts
- 13/04 • Roof drainage; Drainage fittings in flat roofs (gutter tiles E04D 1/30; gutter slabs E04D 3/40; street gullies E03F 5/04)
- 13/064 • • Gutters [6]
- 13/068 • • • Means for fastening gutter parts together [6]
- 13/072 • • • Hanging means (in combination with means for fastening gutter parts together E04D 13/068) [6]
- 13/076 • • Devices or arrangements for removing snow, ice or debris from gutters or for preventing accumulation thereof [6]
- 13/08 • • Down pipes; Special clamping means therefor (clamping pipes in general F16B, F16L)
- 13/10 • Snow traps
- 13/12 • Devices or arrangements allowing walking on the roof or in the gutter
- 13/14 • Junctions of roof sheathings to chimneys or other parts extending above the roof
- 13/143 • • with ventilating means [6]
- 13/147 • • specially adapted for inclined roofs [6]
- 13/15 • Trimming strips; Edge strips; Fascias (E04D 13/14 takes precedence) [6]
- 13/152 • • with ventilating means [6]
- 13/155 • • retaining the roof sheathing [6]
- 13/158 • • covering the overhang at the eave side, e.g. soffits, or the verge of saddle roofs [6]
- 13/16 • Insulating devices or arrangements in so far as the roof covering is concerned (methods for keeping dry building structures in general E04B 1/70; buildings for extreme climates E04H 9/16) [6]
- 13/17 • Ventilation of roof coverings not otherwise provided for (ventilation of rooms or spaces F24F) [6]
- 13/18 • Roof covering aspects of energy collecting devices, e.g. including solar panels (heat collectors per se F24J, e.g. solar heat collectors F24J 2/02; semiconductor devices for converting solar energy into electrical energy H01L 25/00, H01L 31/00) [4]
- 15/00 Apparatus or tools for roof working**
- 15/02 • for roof coverings comprising tiles, shingles, or like roofing elements
- 15/04 • for roof coverings comprising slabs, sheets or flexible material
- 15/06 • for handling roofing or sealing material in roll form
- 15/07 • for handling roofing or sealing material in bulk form

E04F FINISHING WORK ON BUILDINGS, e.g. STAIRS, FLOORS (windows, doors E06B)

Subclass index

SUNSHADES, AWNINGS.....	10/00
STAIRWAYS.....	11/00
COVERING OR FINISHING WALLS, CEILINGS, OR FLOORS.....	13/00, 15/00, 19/00
DUCTS OR CHANNELS.....	17/00
IMPLEMENTS.....	21/00
OTHER FINISHING DETAILS.....	19/00

- 10/00 Sunshades; Awnings** (baldachins A45B, A45F, E04H; trailer awnings E04H 15/08; for tents E04H 15/58)
- 10/02 • of flexible canopy materials, e.g. canvas
- 10/04 • • with material fixed on sections of a collapsible frame
- 10/06 • • comprising a roller-blind with means for holding the end away from a building
- 10/08 • of a plurality of similar rigid parts, e.g. slabs, lamellae (rigidly-arranged sunshade roofs with coherent surfaces E04B 7/00)
- 10/10 • • collapsible
- 11/00 Stairways, ramps, or like structures** (mounting or marking-off stairways E04F 21/26; of temporary construction E04G 27/00); **Balustrades; Handrails** (ladders permanently attached to fixed structures E06C 9/00)
- 11/02 • Stairways; Layouts thereof
- 11/022 • • characterised by the supporting structure [6]
- 11/025 • • • Stairways having stringers [6]
- 11/028 • • • • having a central stringer [6]
- 11/032 • • • Spiral stairways supported by a central column [6]
- 11/035 • • • Stairways consisting of a plurality of assembled modular parts without further support [6]
- 11/038 • • • • each modular part having a load-bearing balustrade part [6]
- 11/04 • • Movable stairways, e.g. of loft ladders which may or may not be concealable or extensible (ship ladders B63B; stairs for aircraft B64F; escalators or moving walkways B66B)
- 11/06 • • • collapsible, e.g. folding, telescopic
- 11/09 • • Tread-and-riser units [6]
- 11/104 • • Treads (E04F 11/09 takes precedence) [6]
- 11/108 • • • of wood [6]
- 11/112 • • • of metal [6]
- 11/116 • • • of stone, concrete or like material [6]
- 11/16 • • • Surfaces thereof; Protecting means for the edges or corners thereof (floor fabrics, fastenings therefor A47G 27/00)
- 11/17 • • • • Surfaces [6]
- 11/18 • Balustrades; Handrails (guard-rails on ships B63B; for bridges E01D 19/10; for roads E01F 13/00, E01F 15/00; fences E04H 17/00)

- 13/00 Coverings or linings, e.g. for walls or ceilings** (flooring E04F 15/00; decoration of surfaces, mosaic work B44, e.g. paper-hanging B44C 7/00; made of webs, e.g. of fabrics or wallpaper, D03D, D04G, D04H, D06N, D21H; construction of ceilings E04B 9/00; roofings or similar water-tight coverings against precipitation E04D) [3]
- 13/02 • of plastic materials hardening after applying, e.g. plaster (surface treatment in painting technique B44D; inorganic or bituminous masses C04B; organic plastics C08L)
- 13/04 • • Bases for plaster (sub-ceilings with plaster-carrying means E04B 9/06)
- 13/06 • • • Edge-protecting borders
- 13/07 • composed of covering or lining elements; Sub-structures therefor; Fastening means therefor [2006.01]
- 13/072 • • composed of specially adapted, structured or shaped covering or lining elements [2006.01]
- 13/073 • • • for particular building parts, e.g. corners or columns [2006.01]
- 13/074 • • • for accommodating service installations or utility lines, e.g. heating conduits, electrical lines, lighting devices or service outlets [2006.01]
- 13/075 • • • for insulation or surface protection, e.g. against noise or impact [2006.01]
- 13/076 • • • characterised by the joints between neighbouring elements, e.g. with joint fillings or with tongue and groove connections [2006.01]
- 13/077 • • • composed of several layers, e.g. sandwich panels (E04F 13/075 takes precedence) [2006.01]
- 13/078 • • • Stretched foil- or web-like elements attached with edge gripping devices [2006.01]
- 13/08 • • composed of a plurality of similar covering or lining elements (E04F 13/072 takes precedence; borders, skirtings E04F 19/02) [1, 2006.01]
- 13/09 • • • of elements attached to a common web, support plate or grid [2006.01]
- Note(s) [2006.01]**
Group E04F 13/09 takes precedence over groups E04F 13/10-E04F 13/18.
- 13/10 • • • of wood [1, 2006.01]
- 13/12 • • • of metal [1, 2006.01]
- 13/14 • • • of stone or stone-like materials, e.g. ceramics; of glass [1, 2006.01]
- 13/15 • • • • characterised by the use of glass elements [2006.01]
- 13/16 • • • of fibres or chips, e.g. bonded with synthetic resins [1, 2006.01]
- 13/18 • • • of organic plastics with or without reinforcements or filling materials (of plastic-bound fibres or chips E04F 13/16) [1, 2006.01]
- 13/21 • • Fastening means specially adapted for covering or lining elements [2006.01]
- 13/22 • • • Anchors, support angles or consoles [2006.01]
- 13/23 • • • • adjustable [2006.01]
- 13/24 • • • Hidden fastening means on the rear of the covering or lining elements (E04F 13/30 takes precedence) [2006.01]
- 13/25 • • • • adjustable [2006.01]
- 13/26 • • • Edge engaging fastening means, e.g. clamps, clips or border profiles [2006.01]
- 13/28 • • • • adjustable [2006.01]
- 13/30 • • • Magnetic fastening means [2006.01]
- 15/00 Flooring** (stair treads E04F 11/104; coverings not specially adapted for floors E04F 13/00; borders, skirtings E04F 19/02; gratings for cleaning soles of footwear A47L 23/24; of similar materials to roads E01C; basic or rough floors E04B 5/00) [6]
- 15/02 • Flooring or floor layers composed of a number of similar elements (of webs E04F 15/16)
- 15/022 • • Flooring consisting of parquetry tiles on a non-rollable sub-layer of other material, e.g. board, concrete, cork [2]
- 15/024 • • Sectional false floors, e.g. computer floors
- 15/04 • • only of wood, e.g. with wooden connecting members (rollable parquet E04F 15/16)
- 15/06 • • of metal, whether or not in combination with other material (gratings as building elements E04C 2/42)
- 15/08 • • only of stone or stone-like material, e.g. concrete; of glass
- 15/10 • • of other materials, e.g. fibrous or chipped materials, organic plastics, magnesite, hardboard
- 15/12 • Flooring or floor layers made of masses *in situ*, e.g. seamless magnesite floors, terrazzo (inorganic or bituminous masses C04B; organic plastic masses C08L)
- 15/14 • • Construction of joints, e.g. dividing strips (sealing joints not restricted to flooring E04B 1/68)
- 15/16 • Flooring, e.g. parquet on flexible web, laid as flexible webs; Webs specially adapted for use as flooring (resiliently-mounted floors, e.g. sprung floors, E04F 15/22; linoleum D06N; webs in general, manufacturing of webs, *see* the relevant classes)
- 15/18 • Separately-laid insulating layers; Other additional insulating measures; Floating floors (insulating of buildings in general E04B 1/62)
- 15/20 • • for sound insulation
- 15/22 • Resiliently-mounted floors, e.g. sprung floors (laid as webs E04F 15/16) [2]
- 17/00 Vertical ducts; Channels, e.g. for drainage** (pipes in general F16L; pipe-line systems F17D)
- 17/02 • for carrying away waste gases, e.g. flue gases (free-standing chimneys E04H 12/28; connections between fireplace and chimney, chimney fittings, covers for cleaning holes of chimneys F23J; chimney tops F23L); Building elements specially designed therefor, e.g. shaped bricks or sets thereof
- 17/04 • Air-ducts or air channels
- 17/06 • Light shafts, e.g. for cellars
- 17/08 • for receiving utility lines, e.g. cables, pipes (covers giving access to the ducts or channels, covers of inspection holes E04F 19/08) [6]
- 17/10 • Arrangements in buildings for the disposal of refuse (refuse bins, gathering or removal of refuse B65F)
- 17/12 • • Chutes
- 19/00 Other details or constructional parts for finishing work on buildings** (ladders, e.g. climbing irons, E06C 9/04)
- 19/02 • Borders; Finishing strips, e.g. beadings; Light coves (for protecting edges of plaster E04F 13/06)
- 19/04 • • for use between floor or ceiling and wall, e.g. skirtings
- 19/06 • • specially designed for securing panels
- 19/08 • Built-in cupboards; Masks of niches; Covers of holes enabling access to installations (clean-out doors of chimneys F23J)

E04F

- 19/10 • Built-in gratings, e.g. foot-scrapers
- 21/00 **Implements for finishing work on buildings** (for working or treating building elements of stone or stone-like material B28D; designed specifically for special details provided for in the other groups of this subclass, see the relevant groups for the details)
- 21/02 • for applying plasticised masses to surfaces, e.g. plastering walls (specially for laying flooring E04F 21/20; applying liquids or other fluent materials to surfaces, in general B05; decorative arts B44)
- 21/04 • • Patterns or templates; Jointing rulers
- 21/05 • • • Supports for jointing rulers
- 21/06 • • Implements for applying plaster, insulating material, or the like
- 21/08 • • • Mechanical implements (E04F 21/14 takes precedence; spraying apparatus in general B05B; sand-blasting B24C)
- 21/10 • • • • centrifugally acting
- 21/12 • • • • acting by gas pressure, e.g. steam pressure
- 21/14 • • • in shafts, e.g. chimneys
- 21/16 • • Implements for after-treatment of plaster or the like, e.g. smoothing tools, profile trowels
- 21/165 • for finishing joints, e.g. implements for raking or filling joints, jointers (bricklayers' tools E04G 21/16; repairing, e.g. filling cracks, E04G 23/02) [3]
- 21/18 • for setting wall or ceiling slabs or plates (tools for mosaic work B44C)
- 21/20 • for laying flooring (made of similar material to roads or pavements E01C)
- 21/22 • • of single elements, e.g. flooring cramps
- 21/24 • • of masses made in situ, e.g. smoothing tools
- 21/26 • for mounting staircases, e.g. tools for marking steps
- 21/28 • for glazing (glass cutters C03B 33/10)
- 21/30 • • Putty squeezers or guns
- 21/32 • • Putty knives; Putty removers

E04G SCAFFOLDING; FORMS; SHUTTERING; BUILDING IMPLEMENTS OR OTHER BUILDING AIDS, OR THEIR USE; HANDLING BUILDING MATERIALS ON THE SITE; REPAIRING, BREAKING-UP OR OTHER WORK ON EXISTING BUILDINGS

Note(s)

In this subclass, the following term is used with the meaning indicated:

- "scaffolding" includes other supports for like purposes.

Subclass index

SCAFFOLDING

- Scaffolds resting on the ground; supported by the building.....1/00, 3/00
- Component parts or accessories; coupling elements.....5/00, 7/00

FALSEWORK, FORMS OR SHUTTERINGS

- For general use.....9/00
- For particular use.....11/00, 13/00, 15/00
- Connecting members, auxiliary members.....17/00
- Auxiliary treatment.....19/00

OTHER IMPLEMENTS OR ACCESSORIES

- Temporary arrangements for access.....27/00
- Preparing or conveying materials.....21/00
- Shores.....25/00

WORKING MEASURES ON EXISTING BUILDINGS.....23/00

Workmen's or safety scaffolds

1/00 Scaffolds primarily resting on the ground

- 1/02 • composed essentially of members elongated in one dimension only, e.g. poles, lattice masts, with or without end portions of special form, connected together by any means
- 1/04 • • the members being exclusively poles, rods, beams, or other members of similar form and simple cross-section
- 1/06 • • • comprising members with rod-like or tubular portions fitting together end to end, with or without separate connecting pieces
- 1/08 • • • secured together by bolts or the like penetrating the members
- 1/10 • • • • Timber-work constructions
- 1/12 • • comprising members of special, e.g. composite, cross-section, or with lugs or the like or lateral apertures for supporting or attaching other members
- 1/14 • Comprising essentially pre-assembled two-dimensional frame-like elements, e.g. of rods in L- or H-shape, with or without bracing (E04G 1/15 takes precedence) [1, 2006.01]
- 1/15 • essentially comprising special means for supporting or forming platforms (E04G 1/20 takes precedence); Platforms (boards or planks therefor E04G 5/08) [1, 2006.01]
- 1/17 • Comprising essentially pre-assembled three-dimensional elements, e.g. cubic elements [2006.01]
- 1/18 • adjustable in height
- 1/20 • • Scaffolds comprising upright members and provision for supporting cross-members or platforms at different positions therealong

- 1/22 • • Scaffolds having a platform on an extensible sub-structure, e.g. of telescopic type or with lazy-tongs mechanism
 - 1/24 • comprising essentially special base constructions; comprising essentially special ground-engaging parts, e.g. inclined struts, wheels (component parts E04G 5/00)
 - 1/28 • designed to provide support only at a low height
 - 1/30 • • Ladder scaffolds
 - 1/32 • • Other free-standing supports, e.g. using trestles (stands or trestles in general F16M 11/00)
 - 1/34 • Scaffold constructions able to be folded in prismatic or flat parts or able to be turned down
 - 1/36 • Scaffolds for particular parts of buildings or buildings of particular shape, e.g. for stairs, cupolas, domes
 - 1/38 • Scaffolds partly supported by the building (ladders attachable to structures E06C 1/34) **[2006.01]**
 - 3/00 Scaffolds essentially supported by building constructions, e.g. adjustable in height** (E04G 1/00 takes precedence)
 - 3/18 • supported by cantilevers or other provisions mounted in openings in the building, e.g. window openings (E04G 3/28 takes precedence) **[2006.01]**
 - 3/20 • supported by walls (E04G 3/28 takes precedence; wall-anchors for supporting scaffolds E04G 5/04; consoles E04G 5/06) **[2006.01]**
 - 3/22 • supported by roofs or ceilings (E04G 3/28 takes precedence) **[2006.01]**
 - 3/24 • specially adapted for particular parts of buildings or for buildings of particular shape, e.g. chimney stacks or pylons (E04G 3/28 takes precedence) **[2006.01]**
 - 3/26 • • specially adapted for working on roofs **[2006.01]**
 - 3/28 • Mobile scaffolds; Scaffolds with mobile platforms **[2006.01]**
 - 3/30 • • suspended by flexible supporting elements, e.g. cables **[2006.01]**
 - 3/32 • • • Hoisting devices; Safety devices **[2006.01]**
 - 3/34 • • characterised by supporting structures provided on the roofs **[2006.01]**
 - 5/00 Component parts or accessories for scaffolds** (connections E04G 7/00) **[1, 2006.01]**
 - 5/02 • Scaffold feet, e.g. with arrangements for adjustment
 - 5/04 • Means for fastening, supporting, or bracing scaffolds on or against building constructions (fastenings in general F16B)
 - 5/06 • Consoles; Brackets
 - 5/08 • Scaffold boards or planks
 - 5/10 • Steps or ladders specially adapted for scaffolds **[2006.01]**
 - 5/12 • Canopies **[2006.01]**
 - 5/14 • Railings **[2006.01]**
 - 5/16 • Struts or stiffening rods, e.g. diagonal rods **[2006.01]**
 - 7/00 Connections between parts of the scaffold** (for building structures in general E04B 1/38; connections in general F16B)
 - 7/02 • with separate coupling elements
 - 7/04 • • Flexible elements, with or without brackets, e.g. ropes, cables, chains (in general F16G)
 - 7/06 • • Stiff scaffolding clamps for connecting scaffold members of common shape
 - 7/08 • • • Clamps for parallelly-arranged members
 - 7/10 • • • Self-tightening clamps, e.g. stirrups
 - 7/12 • • • Clamps or clips for crossing members (E04G 7/22 takes precedence)
 - 7/14 • • • • for clamping the members independently
 - 7/16 • • • • • of which the clamping parts for the different members are rotatable with respect to one another
 - 7/18 • • • • for clamping the members against one another or against a separate cushioning piece between them
 - 7/20 • • • for ends of members only, e.g. for connecting members in end-to-end relation
 - 7/22 • • • for scaffold members in end-to-side relation
 - 7/24 • • • Couplings involving arrangements covered by more than one of the groups E04G 7/08, E04G 7/12, E04G 7/20, E04G 7/22
 - 7/26 • • for use with specially-shaped scaffold members
 - 7/28 • • Clips or connections for securing boards (brackets E04G 5/06)
 - 7/30 • Scaffolding bars or members with non-detachably fixed coupling elements
 - 7/32 • • with coupling elements using wedges **[2006.01]**
 - 7/34 • • with coupling elements using positive engagement, e.g. hooks or pins **[2006.01]**
- Falsework, forms or shutterings for shaping of building parts in situ [5]**
- 9/00 Forming or shuttering elements for general use**
 - 9/02 • Forming boards or similar elements (E04G 9/08, E04G 9/10 take precedence)
 - 9/04 • • the form surface being of wood **[2]**
 - 9/05 • • the form surface being of plastics **[2]**
 - 9/06 • • the form surface being of metal **[2]**
 - 9/08 • Forming boards or similar elements, which are collapsible, foldable, or able to be rolled up
 - 9/10 • with additional peculiarities such as surface shaping, insulating or heating, permeability to water or air
 - 11/00 Forms, shutterings, or falsework for making walls, floors, ceilings, or roofs**
 - 11/02 • for rooms as a whole, whole storeys, or whole buildings
 - 11/04 • for structures of spherical, spheroid or similar shape, or for cupola structures of circular or polygonal horizontal or vertical section; Inflatable forms (connection of valves to inflatable elastic bodies B60C 29/00)
 - 11/06 • for walls, e.g. curved (E04G 11/04 takes precedence)
 - 11/08 • • Forms which are completely dismantled after setting of the concrete and re-built for the next pouring (connecting or supporting means for forms E04G 17/00)
 - 11/10 • • • of elements without beams (E04G 11/18 takes precedence)
 - 11/12 • • • of elements and beams (E04G 11/18 takes precedence)
 - 11/14 • • • • with beams arranged in alignment with, and between the, elements
 - 11/16 • • • • with beams placed within the wall
 - 11/18 • • • for double walls
 - 11/20 • • Movable forms; Movable forms for moulding cylindrical, conical, or hyperbolical structures; Templates serving as forms for positioning blocks or the like (E04G 11/04 takes precedence)
 - 11/22 • • • Sliding forms raised continuously or step-by-step and being in contact with the poured concrete during raising; Arrangements of lifting means therefor

E04G

- 11/24 • • • Construction of lifting jacks or climbing rods for sliding forms (climbing-type hoisting units in general B66F)
- 11/26 • • • the sheathing of which consists of ribbons, endless aprons, or the like, guided by driven rollers
- 11/28 • • • Climbing forms, i.e. forms which are not in contact with the poured concrete during lifting from layer to layer
- 11/30 • • • which are lifted from layer to layer by turning, tilting, or similar moving upwards about a horizontal axis
- 11/32 • • • Tilttable forms or tilting tables for making walls as a whole or in parts in situ
- 11/34 • • • Horizontally-travelling moulds for making walls blockwise or sectionwise (E04G 11/26 takes precedence)
- 11/36 • for floors, ceilings, or roofs of plane or curved surfaces
- 11/38 • • for plane ceilings of concrete
- 11/40 • • for coffered or ribbed ceilings
- 11/42 • • • with beams of metal or prefabricated concrete
- 11/44 • • • with supporting beams for the shuttering used simultaneously as permanent reinforcement of the ribs
- 11/46 • • • of hat-like or trough-like shape encasing a rib or the section between two ribs or encasing one rib and its adjacent flat floor or ceiling section
- 11/48 • • Supporting structures for shutterings or frames for floors or roofs (struts E04G 25/00)
- 11/50 • • • Girders, beams, or the like as supporting members for forms (members, e.g. consoles, for attachment to the wall E04G 17/16; girders intended to form part of the construction E04C 3/02)
- 11/52 • • • • of several units arranged one after another
- 11/54 • • • • of extensible type, with or without adjustable supporting shoes, fishplates, or the like
- 11/56 • • • • • of telescopic type
- 13/00 Falsework, forms or shutterings for particular parts of buildings, e.g. stairs, steps, cornices or balconies** (moulds for making units for prefabricated buildings or prefabricated stair units B28B 7/22)
- 13/02 • for columns or like pillars; Special tying or clamping means therefor
- 13/04 • for lintels, beams, or transoms to be encased separately; Special tying or clamping means therefor (members, e.g. consoles, for attachment to the wall E04G 17/16)
- 13/06 • for stairs, steps, cornices, balconies, or other parts corbelled out of the wall
- 15/00 Forms or shutterings for making openings, cavities, slits, or channels** (forming part of shuttering for walls E04G 11/06)
- 15/02 • for windows, doors, or the like
- 15/04 • Cores for anchor holes or the like
- 15/06 • for cavities or channels in walls or floors, e.g. for making chimneys
- 17/00 Connecting or other auxiliary members for forms, falsework structures, or shutterings**
- 17/02 • Connecting or fastening means for non-metallic forming or stiffening elements
- 17/04 • Connecting or fastening means for metallic forming or stiffening elements
- 17/06 • Tying means; Spacers
- 17/065 • • Tying means, the tensional elements of which are threaded to enable their fastening or tensioning [5]
- 17/07 • • Tying means, the tensional elements of which are fastened or tensioned by means of wedge-shaped members [5]
- 17/075 • • Tying means, the tensional elements of which are fastened or tensioned by other means [5]
- 17/12 • • with arms engaging the forms
- 17/14 • Bracing or strutting arrangements for formwalls; Devices for aligning forms (E04G 25/00 takes precedence)
- 17/16 • Members, e.g. consoles, for attachment to the wall to support girders, beams, or the like carrying forms or moulds for floors, lintels, or transoms
- 17/18 • Devices for suspending or anchoring form elements to girders placed in ceilings, e.g. hangers
- 19/00 Auxiliary treatment of forms, e.g. dismantling; Cleaning devices** (lubricating compositions C10M)

- 21/00 Preparing, conveying, or working-up building materials or building elements in situ; Other devices or measures for constructional work** (working stone-like materials B28D; conveying in general B65G; lifting devices B66; measuring instruments G01)
- 21/02 • Conveying or working-up concrete or similar masses able to be heaped or cast (working concrete in general, e.g. mixing machines, B28C; composition of concrete C04B; construction and surfacing of floorings made of similar material to roads or pavements E01C; in connection with barrages E02B 7/00; in connection with foundations E02D 15/00; in connection with finishing work E04F)
- 21/04 • • Devices for both conveying and distributing (concrete pumps F04)
- 21/06 • • Compacting concrete, e.g. by application of vacuum before hardening (for road building E01C 19/00; devices for compacting also soil E02D 3/02)
- 21/08 • • • Internal vibrators
- 21/10 • • Devices for levelling, e.g. templates or boards (smoothing tools E04F 21/16, E04F 21/24)
- 21/12 • Mounting of reinforcing inserts; Prestressing (shell tubes for prestressing members E04C 5/10; anchoring means E04C 5/12; connections of reinforcing elements and spacers E04C 5/16)
- 21/14 • Conveying or assembling building elements (roofing E04D; finishing work E04F)
- 21/16 • • Tools or apparatus (devices for erecting fences E04H 17/26)
- 21/18 • • • Adjusting tools; Templates
- 21/20 • • • for applying mortar
- 21/22 • • • for setting building elements with mortar, e.g. brick-laying machines
- 21/24 • Safety or protective measures preventing damage to building parts or finishing work during construction (as auxiliary structures for scaffolds E04G 5/00)
- 21/26 • • Strutting means for wall parts; Supports or the like, e.g. for holding in position prefabricated walls (E04G 25/00 takes precedence; on existing buildings E04G 23/04)
- 21/28 • • against unfavourable weather influence
- 21/30 • • against mechanical damage or dirt, e.g. guard covers of stairs

- 21/32 • Safety or protective measures for persons during the construction of buildings (related to scaffolds E04G 5/00; ropes or belts for life-saving A62B 1/16, A62B 35/00; climbing tools, e.g. climbing irons for masts, A63B 27/00)
- 23/00 **Working measures on existing buildings** (on foundations E02D 35/00, E02D 37/00; in connection with insulations E04B; subsequent or finishing work E04F)
- Note(s)**
In addition to the subject matter referred out in this group, subject matter relating to working measures on existing buildings which are analogous to those used in constructing new buildings, is classified in the appropriate construction groups.
- 23/02 • Repairing, e.g. filling cracks; Restoring; Altering; Enlarging
- 23/03 • • specially adapted for roofs, e.g. to fit out attics [5]
- 23/04 • Propping of endangered or damaged buildings or building parts, e.g. with respect to air-raid action (struts E04G 25/00)
- 23/06 • Separating, lifting, removing of buildings; Making a new sub-structure
- 23/08 • Wrecking of buildings (dismantling bridges E01D 24/00) [1, 2006.01]
- 25/00 **Shores or struts** (specially designed for use in mines E21D 15/00); **Chocks**
- 25/02 • non-telescopic
- 25/04 • telescopic
- 25/06 • • with parts held together by positive means
- 25/08 • • with parts held relatively to each other by friction or gripping
- 27/00 **Temporary arrangements for giving access from one level to another for men or vehicles, e.g. steps, ramps** (as parts or accessories for scaffolds E04G 5/00; gangways B63; lifts B66; landing bridges E01D 15/24; permanent stairways or ramps E04F 11/00; ladders E06C)

E04H BUILDINGS OR LIKE STRUCTURES FOR PARTICULAR PURPOSES; SWIMMING OR SPLASH BATHS OR POOLS; MASTS; FENCING; TENTS OR CANOPIES, IN GENERAL (foundations E02D) [4]

Note(s)

- This subclass covers
 - primarily the layout of buildings as a whole;
 - details which are peculiar to types of buildings, or buildings for special purposes, specified in the groups;
 - canopies in general and canopies similar in construction to tents.
- This subclass does not cover canopies having special application, which are covered by the relevant place, e.g. protecting chairs against the weather A47C 7/66, bed canopies A47C 29/00, sun shades or awnings for buildings E04F 10/00.
- In this subclass, the following terms are used with the meanings indicated:
 - "buildings" does not exclude engineering structures and other constructions;
 - "tent" means a tent or canopy having a supporting means, e.g. frame and a flexible cover.

Subclass index

BUILDINGS

For dwelling or office purposes.....	1/00
For public purposes.....	3/00
For industrial or agricultural purposes; for parking.....	5/00, 6/00
SWIMMING OR SPLASH BATHS OR POOLS.....	4/00
CONTAINERS.....	7/00
BUILDINGS AFFORDING SPECIAL PROTECTION.....	9/00
TOWERS, MASTS, CHIMNEY STACKS.....	12/00
MONUMENTS, TOMBS.....	13/00
BUILDINGS FOR COMBINATIONS OF DIFFERENT PURPOSES, DRIVE-IN BUILDINGS.....	14/00
TENTS, CANOPIES.....	15/00
FENCING, ENCLOSURES, CORRALS.....	17/00

- 1/00 **Buildings or groups of buildings for dwelling or office purposes; General layout, e.g. modular co-ordination, staggered storeys** (E04H 3/00 takes precedence; buildings for two or more purposes, drive-in buildings E04H 14/00; building construction in general E04B 1/00)
- 1/02 • Dwelling houses; Buildings for temporary habitation (small erections for limited occupation E04H 1/12)
- 1/04 • • Apartment houses arranged in two or more levels
- 1/06 • Office buildings; Banks (E04H 1/12 takes precedence; furniture or fittings for shops, storehouses, or the like A47F)
- 1/12 • Small buildings or other erections for limited occupation, erected in the open air or arranged in buildings, e.g. kiosks, waiting shelters for bus stops or for filling stations, roofs for railway platforms, watchmen's huts, dressing cubicles (movable screens as household equipment A47G 5/00)
- 1/14 • • Telephone cabinets
- 3/00 **Buildings or groups of buildings for public or similar purposes; Institutions, e.g. infirmaries, prisons** (portions of buildings for individual occupation, e.g. cubicles, E04H 1/00; structures covering a large free area E04B 1/342)

E04H

- 3/02 • Hotels; Motels; Coffee-houses; Restaurants; Shops; Department stores
- 3/04 • • Restaurants or shops having arrangements for self-service (paying counters A47F 9/02; furniture or installations specially adapted for supermarkets A47F 10/00; transport aspects B65G; coin-freed apparatus G07F)
- 3/06 • Museums; Library buildings
- 3/08 • Hospitals, infirmaries, or the like; Schools; Prisons
- 3/10 • for meetings, entertainments, or sports
- 3/12 • • Tribunals, grandstands or terraces for spectators (auditoriums E04H 3/30; chairs, stools, benches A47C) [2]
- 3/14 • • Gymnasiums; Other sporting buildings (tribunes E04H 3/12)
- 3/16 • • • for swimming (swimming or splash baths or pools E04H 4/00) [5]
- 3/22 • • Theatres; Concert halls; Studios for broadcasting, cinematography, television or similar purposes (drive-in buildings E04H 14/00; equipment for theatres or concert halls A63J) [2]
- 3/24 • • • Constructional features of stages
- 3/26 • • • • Revolving stages; Stages able to be lowered (devices for raising or lowering persons A63J 5/12)
- 3/28 • • • • Shiftable or portable platforms
- 3/30 • • • • Constructional features of auditoriums (chairs, stools, benches A47C; building details providing acoustical effects E04B 1/99)

4/00 Swimming or splash baths or pools (wave-producers for baths A47K 3/10; separation B01D; treatment of water C02F; wave-producing pumps F04D 35/00) [5]

- 4/02 • formed *in situ* [5]
- 4/04 • prefabricated or composed of prefabricated elements [5]
- 4/06 • Safety devices; Coverings for baths [5]
- 4/08 • • Coverings consisting of rigid elements [5]
- 4/10 • • Coverings of flexible material [5]
- 4/12 • Devices or arrangements for circulating water [5]
- 4/14 • Parts, details or accessories not otherwise provided for [5]
- 4/16 • • specially adapted for cleaning (cleaning devices peculiar to vessels B63B 59/00) [5]

5/00 Buildings or groups of buildings for industrial or agricultural purposes (building construction in general E04B 1/00)

- 5/02 • Buildings or groups of buildings for industrial purposes, e.g. for power-plants, factories (buildings forming part of cooling plants E04H 5/10; building structures for parking vehicles E04H 6/00)
- 5/04 • • Transformer houses; Substations or switchgear houses [5]
- 5/06 • • Pits or building structures for inspection or services (manhole shafts or other inspection chambers in general E02D 29/12)
- 5/08 • Buildings or groups of buildings for agricultural purposes (silos E04H 7/22; manure storage places A01C 3/02; greenhouses A01G 9/14)
- 5/10 • Buildings forming part of cooling plants
- 5/12 • • Cooling towers (towers in general E04H 12/00; cooling equipment F28)

6/00 Buildings for parking cars, rolling-stock, aircraft, vessels, or like vehicles, e.g. garages (tents for use as garages E04H 15/00; bicycle stands B62H; storing of vessels on land B63C 15/00; construction of ground-supported surfaces E01C; marking of parking areas on the ground E01F 9/00; building construction in general E04B 1/00)

- 6/02 • Small garages, e.g. for one or two cars (attached to, or supported by, the vehicle B62D; prefabricated and with undivided interior E04B 1/343)
- 6/04 • • wheeled, hinged, foldable, telescopic, swinging, or otherwise movable (transportable or collapsible buildings in general E04B 1/343)
- 6/06 • • with means for shifting or lifting vehicles
- 6/08 • Garages for many vehicles
- 6/10 • • without mechanical means for shifting or lifting vehicles, e.g. with helically-arranged fixed ramps, with movable ramps
- 6/12 • • with mechanical means for shifting or lifting vehicles
- 6/14 • • • with endless conveyer chains having load-carrying parts moving vertically, e.g. paternoster lifts
- 6/16 • • • Garages shaped as a wheel or drum rotatable about a horizontal axis
- 6/18 • • • with means for transport in vertical direction only or independently in vertical and horizontal directions (E04H 6/14 takes precedence)
- 6/20 • • • • characterised by use of conveyer chains or rotatable rollers for horizontal transport
- 6/22 • • • • characterised by use of movable platforms for horizontal transport
- 6/24 • • • • characterised by use of dollies for horizontal transport
- 6/26 • • • • characterised by use of tiltable floors or floor sections; characterised by use of movable ramps
- 6/28 • • • • characterised by use of turntables or rotary rings for horizontal transport
- 6/30 • • • with means for transport in horizontal direction only
- 6/32 • • • • characterised by use of conveyer chains or rotatable rollers
- 6/34 • • • • characterised by use of movable platforms
- 6/36 • • • • characterised by use of freely-movable dollies
- 6/38 • • • • characterised by use of tiltable floors or floor sections
- 6/40 • • • • characterised by use of turntables or rotary rings
- 6/42 • Devices or arrangements peculiar to garages, not covered elsewhere, e.g. securing devices, safety devices
- 6/44 • for storing aircraft (structures covering a large free area E04B 1/342)

7/00 Construction or assembling of bulk storage containers employing civil engineering techniques in situ or off the site (tower aspects E04H 12/00; storage aspects, e.g. floating roofs, sealing means, filling or discharging means B65D, B65G, F17B, F17C; foundations E02D 27/38) [2]

- 7/02 • Containers for fluids or gases; Supports therefor (arrangements or adaptations of tanks for water supply E03B 11/00) [2]
- 7/04 • • mainly of metal
- 7/06 • • • with vertical axis
- 7/14 • • • ball-shaped

- 7/16 • • • with horizontal axis
- 7/18 • • mainly of concrete, e.g. reinforced concrete, or other stone-like material
- 7/20 • • • Prestressed constructions
- 7/22 • Containers for fluent solids, e.g. silos, bunkers; Supports therefor [2]
- 7/24 • • Constructions, with or without perforated walls, depending on the use of specified materials
- 7/26 • • • mainly of concrete, e.g. reinforced concrete, or other stone-like material
- 7/28 • • • • composed of special building elements
- 7/30 • • • mainly of metal
- 7/32 • • • mainly of wood

- 9/00 Buildings, groups of buildings, or shelters, adapted to withstand or provide protection against, abnormal external influences, e.g. war-like action, earthquake, extreme climate** (floating buildings B63B; foundation aspects E02D; building constructions in general E04B; bearings or like supports allowing movement E04B 1/36; special details regarding insulation or other protection E04B 1/62; supporting structures for endangered or damaged existing buildings or parts thereof E04G 23/04; doors, windows E06B 5/00; air-conditioning, ventilation F24F; camouflage F41H 3/00; cells or rooms shielded against dangerous radiation G21F 7/00)
- 9/02 • withstanding earthquake or sinking of ground (foundations E02D 27/34)
- 9/04 • against air-raid or other war-like actions (respiratory apparatus A62B)
- 9/06 • • Structures arranged in, or forming part of, buildings
- 9/08 • • • Structures arranged underneath buildings, e.g. air-raid shelters
- 9/10 • • Independent shelters; Arrangement of independent splinter-proof walls
- 9/12 • • • entirely underneath the level of the ground, e.g. air-raid galleries (tunnels, galleries E21D)
- 9/14 • against other dangerous influences, e.g. tornadoes, floods
- 9/16 • against adverse conditions, e.g. extreme climate, pests

- 12/00 Towers; Masts, poles; Chimney stacks; Water-towers; Methods of erecting such structures** (cooling towers E04H 5/12; supports for road signs E01F 9/011; foundation piles E02D 5/22; foundations for masts, poles, or chimneys E02D 27/42; structural elongated members in general E04C 3/00; fixed climbing irons E06C 9/04; derricks for oil drilling E21B 15/00) [6]
- 12/02 • Structures made of specified materials (E04H 12/16, E04H 12/18 take precedence)
- 12/04 • • of wood
- 12/06 • • • Truss-like structures
- 12/08 • • of metal
- 12/10 • • • Truss-like structures
- 12/12 • • of concrete or other stone-like material, with or without internal or external reinforcement, e.g. with metal coverings, with permanent form elements
- 12/14 • • • Truss-like structures
- 12/16 • Prestressed structures
- 12/18 • movable or with movable sections, e.g. rotatable, telescopic (rotary buildings E04B 1/346)
- 12/20 • Side-supporting means therefor, e.g. using guy ropes, struts (ground anchors E02D 5/80; fastening means for cables or ropes F16G 11/00)

- 12/22 • Sockets or holders for poles or posts
- 12/24 • Cross-arms
- 12/26 • Winding towers for mines (elevators B66B)
- 12/28 • Chimney stacks, e.g. free-standing, or similar ducts (foundations E02D 27/42; chimneys as part of buildings E04F 17/02; connections between furnace and smoke stack, chimney equipment F23J)
- 12/30 • Water-towers (tanks B65D 88/00; use of high-level tanks E03B 11/12)
- 12/32 • Flagpoles (flags, banners, mountings therefor G09F 17/00)
- 12/34 • Arrangements for erecting or lowering towers, masts, poles, chimney stacks, or the like [6]

- 13/00 Monuments; Tombs; Burial vaults; Columbaria** (sculpture or other artistic features B44)

- 14/00 Buildings for combinations of different purposes not covered by any single one of main groups E04H 1/00-E04H 13/00 of this subclass, e.g. for double purpose** (E04H 3/02, E04H 9/06 take precedence); **Buildings of the drive-in type**

- 15/00 Tents or canopies, in general** [4]
- 15/02 • Tents combined or specially associated with other devices [4]
- 15/04 • • suspended type, e.g. from trees, from cantilever supports (supporting frames E04H 15/34) [4]
- 15/06 • • Tents at least partially supported by vehicles [4]
- 15/08 • • • Trailer awnings or the like [4]
- 15/10 • • Heating, lighting, or ventilating (for heating, lighting, or ventilating devices *per se*, see the relevant classes, e.g. F21, F24) [4]
- 15/12 • • • Heating [4]
- 15/14 • • • Ventilating [4]
- 15/16 • • • • of tent roofs [4]
- 15/18 • Tents having plural sectional covers, e.g. pavilions, vaulted tents, marquees, circus tents (inflatable E04H 15/20); Plural tents, e.g. modular [4]
- 15/20 • inflatable, e.g. shaped, strengthened, or supported by fluid pressure (connection of valves to inflatable elastic bodies B60C 29/00; inflatable forms for making walls, floors, ceilings or roofs *in situ* E04G 11/04) [4]
- 15/22 • • supported by air pressure inside the tent [4]
- 15/24 • cone shaped, e.g. teepees [4]
- 15/26 • Center-pole supported tents (umbrella type E04H 15/28) [4]
- 15/28 • Umbrella type tents [4]
- 15/30 • convertible, e.g. from one type tent to another type tent, from tent to canopy, from tent cover into diverse article (sacks or packs convertible into tents A45F 4/04; coats or capes convertible into tent coverings A45F 4/14) [4]
- 15/32 • Parts, components, construction details, accessories, interior equipment, specially adapted for tents, e.g. guy-line equipment, skirts, thresholds [4]
- 15/34 • • Supporting means, e.g. frames [4]
- 15/36 • • • arch-shaped type (E04H 15/42 takes precedence) [4]
- 15/38 • • • • expansible, e.g. extensible [4]
- 15/40 • • • • flexible [4]
- 15/42 • • • external type, e.g. frame outside of cover [4]
- 15/44 • • • collapsible, e.g. breakdown type (E04H 15/42 takes precedence; building structures having collapsible parts in general E04B 1/343) [4]
- 15/46 • • • • telescoping and foldable [4]

E04H

- 15/48 • • • • foldable, i.e. having pivoted or hinged means (E04H 15/46 takes precedence) [4]
- 15/50 • • • • • lazy-tongs type [4]
- 15/52 • • • • • parallelogram type [4]
- 15/54 • • Covers of tents or canopies (ventilated tent roofs E04H 15/16) [4]
- 15/56 • • Floors [4]
- 15/58 • • Closures; Awnings; Sunshades [4]
- 15/60 • • Poles [4]
- 15/62 • • Pegs, stakes or the like [4]
- 15/64 • • Tent or canopy cover fastenings [4]
- 17/00 **Fencing, e.g. fences, enclosures, corrals** (features peculiar to electrified fences A01K 3/00, H05C; means for allowing passage through fences, barriers, or the like E06B 11/00)
- 17/02 • Wire fencing, e.g. made of wire mesh (E04H 17/14 takes precedence; working or processing of wire B21F, e.g. making wire nets B21F 27/00)
- 17/04 • • characterised by the use of specially adapted wire, e.g. barbed wire [1, 7]
- 17/06 • • Parts for wire fences
- 17/08 • • • Anchoring means therefor, e.g. specially-shaped parts entering the ground; Struts or the like (for towers or masts E04H 12/20; sockets for posts E04H 12/22)
- 17/10 • • characterised by the way of connecting wire to the posts; Droppers
- 17/12 • • • the wire being placed in slots, grooves, or the like
- 17/14 • Fences constructed of rigid elements, e.g. with additional wire fillings or with posts
- 17/16 • • using prefabricated panel-like elements, e.g. wired frames
- 17/18 • • • Corrals, i.e. easily transportable or demountable enclosures
- 17/20 • • Posts therefor
- 17/22 • • • Anchoring means therefor, e.g. specially-shaped parts entering the ground; Struts or the like (for towers or masts E04H 12/20; sockets for posts E04H 12/22)
- 17/24 • • Connections for attaching additional wire to frames, posts or railings
- 17/26 • Devices for erecting or removing fences

E05 LOCKS; KEYS; WINDOW OR DOOR FITTINGS; SAFES

Note(s)

In this class, the following terms are used with the meanings indicated:

- "wing" is a general term for swingable, slidable, or otherwise movable doors or windows. This term also includes other movable structures such as drawers, lids of chests, car boots, or car bonnets, to which the operating, mounting, latching, or locking means covered by this class may be applied;
- "frame" means any member to which a wing may be held by a fastening device. It does not include a framework forming part of the wing, but it may be another wing;
- "lock" means primarily a device for releasing or securing any member, which requires a key or a permutation mechanism for release. In groups E05B 1/00-E05B 9/00, E05B 13/00-E05B 17/00, E05B 39/00-E05B 47/00, E05B 51/00, E05B 53/00, E05B 63/00 and E05B 65/00 however, the term "lock" may include other fastening devices;
- "bolt" means a sliding, pivoted, or otherwise movable member such as is normally carried by a door to hold it shut by engagement with a keeper on the frame. It may be operated by hand directly or through mechanism or by a key; it may be a latch ([see](#) below);
- "latch" means a bolt arranged to be moved to the releasing position against the force of a spring, or some other returning force, when a wing meets the frame on closing, so that it does not have to be operated by hand to secure the wing, but only to open it;
- "hasp" means a member hinged to the frame or wing so that it can be moved towards the face of the wing or frame and secured thereto, e.g. by a turn-button, by a padlock and staple.

E05B LOCKS; ACCESSORIES THEREFOR; HANDCUFFS

Subclass index

LOCKS WITH TUMBLERS

Moved by rotation of the key.....21/00, 23/00, 25/00

Set by pushing the key in.....27/00-33/00

LOCKS FOR USE WITH SPECIAL KEYS OR KEY SETS.....35/00

PERMUTATION OR PUZZLE LOCKS.....37/00, 49/00

PADLOCKS.....67/00, 37/00

LOCKS WITH INDICATING OR TIMING DEVICES.....39/00-45/00

LOCKS WITH PROVISION FOR LATCHING.....55/00-61/00, 65/20

LOCKS WITH OTHER SPECIAL STRUCTURAL FEATURES.....63/00

LOCKS FOR SPECIAL USE.....65/00, 69/00-75/00

OPERATION OR CONTROL OF LOCKS.....47/00-53/00

DETAILS OR ACCESSORIES OF LOCKS OR THE LIKE, KEYS

Knobs or handles.....1/00-7/00

Other details or accessories of locks or latches.....9/00-17/00

Keys.....19/00

HANDCUFFS.....75/00

Details or accessories of locks or the like; keys

- 1/00 Knobs or handles for wings** (for furniture A47B 95/02); **Knobs, handles, or press buttons for locks or latches on wings** (E05B 5/00, E05B 7/00 take precedence)
- 1/02 • of solid material
 - 1/04 • with inner rigid member and outer cover or covers
 - 1/06 • of sheet material
- 3/00 Fastening handles to lock or latch parts**
- 3/02 • Fastening handles to the spindle by pinning or riveting
 - 3/04 • Fastening the handle shank to the spindle by screws, springs, or snap bolts
 - 3/06 • by means arranged in or on the rose
 - 3/08 • Fastening the spindle to the follower
 - 3/10 • by a bipartite or cleft spindle in the follower or in the handle shank
- 5/00 Handles completely let into the surface of the wing**
- 5/02 • able to be turned outwards before operation
 - 5/04 • able to be shifted parallel to the wing after being pulled out
- 7/00 Handles pivoted about an axis parallel to the wing** (E05B 5/00 takes precedence)
- 9/00 Lock or latch-mechanism casings mountable on or in wings** (padlock casings E05B 67/02)
- 9/02 • of latch-bolt locks
 - 9/04 • of cylinder locks
 - 9/06 • Fastening together the parts of casings
 - 9/08 • Fastening the casings of latch-bolt locks or cylinder locks to the wing
 - 9/10 • Coupling devices for the two halves of double cylinder locks
- 11/00 Devices preventing keys from being removed from the lock**
- 11/02 • before the wing is locked
 - 11/04 • before the wing is closed
 - 11/06 • for catching skeleton or incorrect keys
- 13/00 Devices preventing the key or the handle or both from being used**
- 13/02 • shaped as sectors of escutcheons, arranged in the keyhole
 - 13/04 • shaped as fork-like implements grasping and fixing the key
 - 13/06 • shaped as bolt detents arranged in the path of motion of the key bit
 - 13/08 • formed by longitudinal bolt or cross-bar connecting the handle with a stationary lock part or fitting
 - 13/10 • formed by a lock arranged in the handle
- 15/00 Other details of locks; Parts for engagement by bolts of fastening devices** (fastening devices for wings other than locks or associated with locks E05C)
- 15/02 • Striking-plates; Keepers; Bolt staples; Escutcheons
 - 15/04 • Spring arrangements in locks
 - 15/06 • Lock wards
 - 15/08 • Key guides; Key pins
 - 15/10 • Bolts of locks or night latches
 - 15/12 • Pins or detents for locking bolts
 - 15/14 • Tumblers
 - 15/16 • Use of special materials for parts of locks (for handles E05B 1/00)

- 17/00 Accessories in connection with locks** (locks with indicating or timing devices E05B 39/00-E05B 45/00; buffers E05F 5/00; means for preventing rattling of wings E05F 7/04; means for taking the weight of the wing E05F 7/06) **[4]**
- 17/02 • Coupling devices for double doors, i.e. two doors one behind the other and hinged on the same side
 - 17/04 • Devices for coupling the turning cylinder of a single or double cylinder lock with the bolt-operating member
 - 17/06 • Templates for marking the position of apertures in fittings of wings
 - 17/08 • Lubricating devices
 - 17/10 • Illuminating devices on, or for, locks or keys
 - 17/12 • Devices for removing keys stuck in the lock
 - 17/14 • Closures or guards for keyholes
 - 17/16 • • shaped as pins or key bits
 - 17/18 • • shaped as lids or slides
 - 17/20 • Means independent of the locking mechanism for preventing unauthorised opening, e.g. for securing the bolt in the fastening position (pins or detents E05B 15/12) **[4]**
 - 17/22 • Means for operating or controlling lock or fastening device accessories, i.e. other than the fastening members, e.g. switches, indicators **[4]**
- 19/00 Keys; Accessories therefor** (making keys, see the relevant places, e.g. B21D 53/42; milling grooves in keys B23C 3/35)
- 19/02 • Construction of the shank of the key
 - 19/04 • Construction of the bow of the key; Construction of flat keys
 - 19/06 • Key bits; Flat key bits
 - 19/08 • • Special forms of key bits, e.g. double key bits, folding key bits
 - 19/10 • Fastening the key bit and bow on the shank of the key
 - 19/12 • Keys with several bits moving relatively to each other when in use
 - 19/14 • Double keys
 - 19/16 • Extremely thin keys acting without rotation
 - 19/18 • Keys adjustable before use
 - 19/20 • Skeleton keys; Devices for picking locks; Other devices for similar purposes
 - 19/22 • Keys with devices for indicating whether the last operation was locking or unlocking
 - 19/24 • Key-distinguishing marks
 - 19/26 • Use of special materials for keys

Locks with rotary keys moving lamelliform tumblers perpendicular to the key

- 21/00 Locks with rotary keys moving lamelliform tumblers perpendicular to the key, in which the tumblers do not follow the movement of the bolt**
- 21/02 • with identical tumblers
 - 21/04 • with stop pins on the tumbler (E05B 21/02 takes precedence)
 - 21/06 • Cylinder locks, e.g. protector locks
- 23/00 Locks with rotary keys moving lamelliform tumblers perpendicular to the key, in which the tumblers follow the movement of the bolt**
- 25/00 Locks with rotary keys moving lamelliform tumblers perpendicular to the key, characterised by the tumblers**

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- 25/02 • with tumblers in the cut-out of which the key bit is moved
- 25/04 • with tumblers in which the stop pin is guided from one locked position to the other in an inclined direction
- 25/06 • with tumblers in which the stop pin is guided from one locked position to the other along a curved path
- 25/08 • with tumblers with movable pawls engaging the key
- 25/10 • with tumblers formed to engage one another to determine their unlocked position

Locks of which the tumblers are set by pushing the key in

- 27/00 Cylinder locks with tumbler pins or balls that are set by pushing the key in**
 - 27/02 • operated by the edge of the key
 - 27/04 • • arranged radially in one row
 - 27/06 • • arranged radially in more than one row
 - 27/08 • • arranged axially
 - 27/10 • operated by other surfaces of the key, e.g. openings receiving projections on the tumblers
- 29/00 Cylinder locks with plate tumblers that are set by pushing the key in**
 - 29/02 • operated by the edge of the key
 - 29/04 • • arranged singly
 - 29/06 • • arranged in pairs
 - 29/08 • operated by other surfaces of the key
 - 29/10 • • operated by a curved groove or slot
 - 29/12 • • operated by a curved rib
 - 29/14 • with both axially and radially arranged plate tumblers
- 31/00 Cylinder locks with both tumbler pins or balls and plate tumblers that are set by pushing the key in**
- 33/00 Cylinder lock with tumblers that are set by pushing the key in, in which the bolt is moved by means other than the key**

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- 35/00 Locks for use with special keys or a plurality of keys**
 - 35/02 • which can be shifted laterally
 - 35/04 • for pull keys
 - 35/06 • for screw keys
 - 35/08 • operable by a plurality of keys
 - 35/10 • • with master and pass keys
 - 35/12 • • requiring the use of two keys, e.g. safe-deposit locks
 - 35/14 • with keys of which different parts operate separate mechanisms
 - 37/00 Permutation locks** (electric permutation locks E05B 49/00; for bicycles E05B 71/02); **Puzzle locks**
 - 37/02 • with tumbler discs or rings arranged on a single axis, each disc being adjustable independently of the others
 - 37/04 • with tumbler discs on a single axis, all the discs being adjustable by rotating a shiftable knob
 - 37/06 • • in padlocks
 - 37/08 • with tumbler discs on a single axis, all the discs being adjustable by a rotary knob which is not shifted
 - 37/10 • • in padlocks
 - 37/12 • with tumbler discs on several axes
 - 37/14 • • in padlocks

- 37/16 • with two or more push or pull knobs, slides, or the like
- 37/18 • • in padlocks
- 37/20 • Puzzle locks
- 37/22 • • in padlocks

Locks with indicating or timing devices

- 39/00 Locks giving indication of unauthorised unlocking**
 - 39/02 • with destructible seal closures or paper closures (seals per se G09F 3/00) [4]
 - 39/04 • with counting or registering devices
- 41/00 Locks with visible indication as to whether the lock is locked or unlocked**
- 43/00 Time locks** (clocks or clock mechanisms with attached or built-in means operating any device at preselected times or after a predetermined time interval G04C 23/00)
- 45/00 Alarm locks** (alarm devices actuated by tampering with fastenings in general G08B)
 - 45/02 • with mechanically-operated bells
 - 45/04 • with detonating alarm devices
 - 45/06 • Electric alarm locks
 - 45/08 • • with contact making inside the lock or in the striking plate
 - 45/10 • • • by introducing the key
 - 45/12 • • • by movement of the bolt
 - 45/14 • • with contact making outside the lock

Operation or control of locks by non-mechanical means, e.g. from a distance

- 47/00 Operating or controlling locks or other fastening devices by electric or magnetic means** (electric permutation locks E05B 49/00; holding in open position or limiting movement of wings by magnetic or electromagnetic attraction E05C 17/56; key switches H01H 27/00) [2]
 - 47/02 • Adaptation of locks, latches, or parts thereof, for movement of the bolt by electromagnetic means
 - 47/04 • • for unlocking only
 - 47/06 • Controlling mechanically-operated bolts by electromagnetically-operated detents
 - 47/08 • • the bolt being withdrawn by a spring which is stressed by closing the wing
- 49/00 Electric permutation locks; Circuits therefor**
 - 49/02 • with electrical arrangements inside the lock
 - 49/04 • with electrical arrangements outside the lock
- 51/00 Operating or controlling locks or other fastening devices by other non-mechanical means**
 - 51/02 • by pneumatic or hydraulic means

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- 53/00 Operation or control of locks by mechanical transmissions, e.g. from a distance** (for passenger doors E05B 65/20)

Locks with provision for latching**55/00 Locks in which a sliding latch is used also as a locking bolt**

- 55/02 • the bolt being secured by the tumbler
- 55/04 • the bolt being secured by the cross-bar or the turnbuckle and the handle being locked
- 55/06 • the handle being disconnected
- 55/08 • • the bolt being secured by transverse bolts
- 55/10 • • without securing the bolt
- 55/12 • the bolt being secured by the operation of a hidden parallel member
- 55/14 • the bolt being secured by the operation of a wing handle, or by means in the wing handle or knob
- 55/16 • • merely by normal use of the handle on one side of the wing

57/00 Locks in which a pivoted latch is used also as locking means**59/00 Locks with latches separate from the lock-bolts, or with a plurality of latches or lock-bolts**

- 59/02 • with arrangements for securing the latch while shooting the lock-bolt
- 59/04 • Locks in which the latch is moved by a lock-bolt, or the lock-bolt by a latch, or one latch by another, or the like
- 59/06 • with a lock-bolt slidable in the latch

61/00 Other locks with provision for latching**Locks with special structural characteristics or for special use****63/00 Locks with special structural characteristics**

- 63/02 • without springs
- 63/04 • for alternative use on the right-hand or left-hand side of wings
- 63/06 • with lengthwise-adjustable bolts
- 63/08 • Mortise locks
- 63/10 • • requiring only two cylindrical holes in the wing
- 63/12 • with means carried by the bolt for interlocking with the keeper (for passenger doors E05B 65/28)
- 63/14 • Arrangement of several locks or locks with several bolts, e.g. arranged one behind the other (locks for keys with several bits E05B 35/14; with provision for latching E05B 59/00, E05B 61/00; arrangements of simultaneously-actuated bolts or other securing devices at well-separated positions on the same wing E05C 9/00) [4]
- 63/16 • with the handles on opposite sides moving independently (the latch being secured by the operation of a wing handle E05B 55/14)
- 63/18 • with arrangements independent of the locking mechanism for retaining the bolt in the retracted position
- 63/20 • • released automatically when the wing is closed
- 63/22 • operated by a pulling or pushing action perpendicular to the front plate (E05B 35/04 takes precedence)
- 63/24 • Arrangements in which the fastening members which engage one another are mounted respectively on the wing and the frame and are both movable, e.g. for release by moving either of them (hasp locks E05B 65/48; hasp fastenings E05C 19/08) [4]

65/00 Locks for special use

- 65/02 • for thin, hollow, or thin-metal wings

- 65/04 • for wings, one behind the other, hinged on the same side (fastening devices specially adapted for two wings which lie one behind the other when closed E05C 7/02) [4]
- 65/06 • for swing doors
- 65/08 • for sliding wings
- 65/10 • for panic or emergency doors
- 65/12 • for vehicles (E05B 71/00 takes precedence; locking arrangements for non-fixed vehicle roofs B60J 7/185) [2]
- 65/14 • • for railway freight-cars or the like; for lorries (E05B 65/20 takes precedence)
- 65/16 • • • for back doors of vans
- 65/18 • • • with provision for sealing
- 65/19 • • for car-boot lids; for car bonnets
- 65/20 • • for passenger or like doors
- 65/22 • • • with rectilinearly-moving bolt
- 65/24 • • • • locked by a special movement of the door handle
- 65/26 • • • • with the outside door handle drawn into a recess when the door is locked
- 65/28 • • • • with means carried by the bolt for interlocking with the keeper
- 65/30 • • • • with two or more bolts moved simultaneously
- 65/32 • • • with the bolt turning about an axis
- 65/34 • • • • in which the member engaging the keeper is shaped as a lockable toothed wheel or the like
- 65/36 • • • Locking several doors simultaneously
- 65/38 • • • • by pneumatic or hydraulic means
- 65/40 • • • Locking one door by shutting another (by non-mechanical means E05B 47/00, E05B 51/00; operation of locks by mechanical transmissions E05B 53/00; fastenings, other than locks, for double doors E05C 7/06)
- 65/42 • • • Securing the latch or bolt by movement of the vehicle
- 65/44 • for furniture or drawers
- 65/46 • • Special locks for drawers, e.g. for a plurality of drawers [4]
- 65/48 • Hasp locks (hasp fastenings other than locks E05C 19/08)
- 65/50 • • for briefcases
- 65/52 • Other locks for chests, boxes, trunks, baskets, travelling bags, or the like (closures for bags or trunks A45C 13/06, A45C 13/10, A45C 13/16)
- 67/00 Padlocks (permutation locks E05B 37/00); Details thereof**
- 67/02 • Cases
- 67/04 • • Armoured cases
- 67/06 • Shackles; Arrangement of the shackle
- 67/08 • • Padlocks with shackles hinged on the case
- 67/10 • • • with devices for securing the free end of the shackle
- 67/12 • • • • with built-in cylinder locks
- 67/14 • • • with devices for securing the hinged end of the shackle
- 67/16 • • • • with built-in cylinder locks
- 67/18 • • • with devices for securing both ends of the shackle
- 67/20 • • • • with built-in cylinder locks
- 67/22 • • Padlocks with sliding shackles, with or without rotary or pivotal movement
- 67/24 • • • with built-in cylinder locks

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- 67/26 • • • with screw action, with or without the shackle being moved by turning the key
- 67/28 • • Padlocks with shackles forming a circle
- 67/30 • • • with built-in cylinder locks
- 67/32 • • Padlocks with pincer-like shackles
- 67/34 • • • with built-in cylinder locks
- 67/36 • Padlocks with closing means other than shackles
- 67/38 • Auxiliary or protective devices

Locking devices for clothing, sticks, umbrellas, or cycles

- 69/00** **Devices for locking clothing; Lockable clothing holders or hangers** (dress or hat holders in general A47G 25/00)

- 69/02 • Lockable clothing hooks (coin-controlled locking hooks G07F)

71/00 **Locks specially adapted for bicycles, other than padlocks** (locks integral with cycles B62H 5/00)

- 71/02 • with permutation locking devices

73/00 **Devices for locking portable objects against unauthorised removal; Locking devices not provided for in other groups of this subclass**

- 73/02 • for walking-sticks or umbrellas (stick or umbrella holders in general A47G 25/12)

75/00 **Handcuffs**

E05C **BOLTS OR FASTENING DEVICES FOR WINGS, SPECIALLY FOR DOORS OR WINDOWS** (latching means for sideboard or tailgate structures for vehicles B62D 33/037; fastening devices for constructional or engineering elements E04, F16B; locks, fastening devices structurally or operatively combined or having significant cooperation with locks E05B; means for operating or controlling wing fasteners in conjunction with mechanisms for moving the wing E05F)

Note(s)

1. In this subclass, only the movement essential for securing the wing is considered, e.g. a sliding bolt which is rotated on its axis to prevent its withdrawal is classified as having only a sliding movement.
2. Attention is drawn to the definitions following the title of class E05.

Subclass index

FASTENING DEVICES

characterised by the way the bolt is moved.....	1/00-5/00
specially for holding wings open.....	17/00, 19/00
specially adapted for two wings.....	7/00
ARRANGEMENT OF FASTENING, SECURING, OR LOCKING DEVICES.....	9/00, 21/00

Bolts, latches or equivalent wing-fastening devices, characterised by special way of movement, e.g. moving rectilinearly, pivotally or rotatively

- 1/00** **Fastening devices with bolts moving rectilinearly** (devices released automatically by pull or pressure on the wing E05C 19/02)
- 1/02 • without latching action
- 1/04 • • with operating handle or equivalent member rigid with the bolt
- 1/06 • • with operating handle or equivalent member moving otherwise than rigidly with the bolt
- 1/08 • with latching action
- 1/10 • • with operating handle or equivalent member rigid with the latch
- 1/12 • • with operating handle or equivalent member moving otherwise than rigidly with the latch
- 1/14 • • • the handle or member moving essentially towards, or away from, the plane of the wing or frame
- 1/16 • • • the handle or member moving essentially in a plane substantially parallel to the wing
- 3/00** **Fastening devices with bolts moving pivotally or rotatively** (devices released automatically by pull or pressure on the wing E05C 19/02)
- 3/02 • without latching action
- 3/04 • • with operating handle or equivalent member rigid with the bolt

- 3/06 • • with operating handle or equivalent member moving otherwise than rigidly with the bolt
- 3/08 • • • the handle or member moving essentially towards, or away from, the plane of the wing or frame
- 3/10 • • • the handle or member moving essentially in a plane substantially parallel to the wing
- 3/12 • with latching action (devices in which the securing part is formed or merely carried by a spring and moves only by distortion of the spring, e.g. snaps, E05C 19/06)
- 3/14 • • with operating handle or equivalent member rigid with the latch
- 3/16 • • with operating handle or equivalent member moving otherwise than rigidly with the latch
- 3/22 • • • the bolt being spring-controlled
- 3/24 • • • • in the form of a bifurcated member
- 3/26 • • • • engaging a stud-like keeper
- 3/28 • • • • • with simultaneously-operating double bolts
- 3/30 • • • • in the form of a hook
- 3/32 • • • • • engaging a hooked keeper (E05C 3/34 takes precedence)
- 3/34 • • • • • with simultaneously-operating double bolts
- 3/36 • • • • in the form of a rotary gear

3/38	• • • •	with bolts engaging a hooked keeper (E05C 3/24, E05C 3/30, E05C 3/36 take precedence)	17/04	• •	with a movable bar or equivalent member extending between frame and wing
3/40	• • • •	with bolts engaging a stud-like keeper (E05C 3/24, E05C 3/30, E05C 3/36 take precedence)	17/06	• • •	releasable to allow further opening only when the wing is nearly closed
5/00		Fastening devices with bolts moving otherwise than only rectilinearly and only pivotally or rotatively (devices released automatically by pull or pressure on the wing E05C 19/02)	17/08	• • •	with special means for release, e.g. automatic release by further opening
5/02	•	both moving axially and turning about their axes to secure the wing	17/10	• • •	incorporating a special device for securing the wing in the closed position
5/04	• •	performing both movements simultaneously, e.g. screwing into a keeper	17/12	• • •	consisting of a single rod
			17/14	• • • •	Hook and eye, or equivalent
			17/16	• • • •	pivoted only at one end and having an elongated slot
			17/18	• • • •	pivoted only at one end and having a row of holes, notches, or pins
			17/20	• • • •	sliding through a guide (E05C 17/18 takes precedence)
			17/22	• • • • •	with braking, clamping or securing means in the guide [4]
			17/24	• • • •	pivoted at one end, and with the other end running along a guide member
			17/26	• • • • •	with braking, clamping or securing means at the pivot of the rod [4]
			17/28	• • • • •	with braking, clamping or securing means at the connection to the guide member [4]
			17/30	• • •	of extensible, e.g. telescopic, construction (flexible members E05C 17/36)
			17/32	• • •	consisting of two or more pivoted rods
			17/34	• • • •	with means for holding in more than one position
			17/36	• • •	comprising a flexible member, e.g. chains
			17/38	• •	with a curved rail rigid with the frame for engagement with means on the wing, or <i>vice versa</i>
			17/40	• •	Bars or like parts connecting a right wing with a left wing which move against each other when being closed
			17/42	• •	connecting exterior and interior wings
			17/44	• •	with a device carried on the wing for frictional or like engagement with a fixed flat surface, e.g. retractable feet
			17/46	• •	in which the wing or a member fixed thereon is engaged by a movable fastening member in a fixed position; in which a movable fastening member mounted on the wing engages a stationary member [4]
			17/48	• • •	comprising a sliding securing member
			17/50	• • •	comprising a single pivoted securing member
			17/52	• • •	comprising a snap, catch, or the like
			17/54	• •	Portable devices, e.g. wedges
			17/56	•	by magnetic or electromagnetic attraction (operation of locks or fasteners by electric or magnetic means E05B 47/00) [2]
			17/58	•	operated or controlled from a distance
			17/60	•	holding sliding wings open [4]
			17/62	• •	using notches [4]
			17/64	• •	by friction [4]
7/00		Fastening devices specially adapted for two wings	19/00		Other devices specially designed for securing wings (movable draft sealings additionally used for bolting E06B 7/18) [2]
		Note(s)	19/02	•	Automatic catches, i.e. released by pull or pressure on the wing (E05C 19/06 takes precedence)
		In this group, if a fastening device merely secures one wing to another wing which is already closed it is not regarded as specially adapted for two wings.	19/04	• •	Ball or roller catches
7/02	•	for wings which lie one behind the other when closed	19/06	•	in which the securing part is formed or carried by a spring and moves only by distortion of the spring, e.g. snaps
7/04	•	for wings which abut when closed	19/08	•	Hasps; Hasp fastenings; Spring catches therefor
7/06	• •	a fastening device for one wing being actuated or controlled by closing another wing			
9/00		Arrangement of simultaneously-actuated bolts or other securing devices at well-separated positions on the same wing (essentially involving locking means E05B 63/14; similar constructions for engineering closures for pressure vessels, in general F16J 13/08)			
9/02	•	with one sliding bar for fastening when moved in one direction and unfastening when moved in opposite direction; with two sliding bars moved in the same direction when fastening or unfastening [4]			
9/04	•	with two sliding bars moved in opposite directions when fastening or unfastening			
9/06	•	with three or more sliding bars			
9/08	•	with a rotary bar for actuating the fastening means			
9/10	•	Actuating mechanisms for bars			
9/12	• •	with gears and racks			
9/14	• •	with pins engaging slots			
9/16	• •	with crank pins and connecting rods			
9/18	•	Details of fastening means or of fixed retaining means for the ends of bars			
9/20	•	Coupling means for sliding bars, rods, or cables [4]			
9/22	•	Guides for sliding bars, rods, or cables (corner guides E05C 9/24) [4]			
9/24	•	Means for transmitting movements between vertical and horizontal sliding bars, rods, or cables, e.g. corner guides (means for transmitting movements between vertical and horizontal sliding bars, rods, or cables, for moving wings into open or closed position E05F 7/08) [4]			
17/00		Devices for holding wings open; Devices for limiting opening of wings or for holding wings open by a movable member extending between frame and wing; Braking devices, stops or buffers, combined therewith (combined with hinges E05D 11/00; combined with operating apparatus for wings E05F; other braking devices, stops, buffers E05F 5/00) [4]			
17/02	•	by mechanical means (E05C 17/60 takes precedence) [4]			

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- 19/10 • Hook fastenings; Fastenings in which a link engages a fixed hook-like member
- 19/12 • • pivotally mounted
- 19/14 • • • with toggle action
- 19/16 • Devices holding the wing by magnetic or electromagnetic attraction

- 19/18 • Portable devices specially adapted for securing wings (preventing operation of handles E05B 13/00)
- 21/00 Arrangement or combinations of wing fastening, securing, or holding devices, not covered by any single one of main groups E05C 1/00-E05C 19/00**
- 21/02 • for holding a wing closed only

E05D HINGES OR OTHER SUSPENSION DEVICES FOR DOORS, WINDOWS, OR WINGS (pivotal connections in general F16C 11/00)

Subclass index

HINGES

General structure.....	1/00, 3/00
Special structure.....	7/00
Details; accessories.....	5/00, 9/00, 11/00
OTHER SUSPENSION DEVICES FOR WINGS.....	13/00, 15/00

1/00 Pinless hinges; Substitutes for hinges

- 1/02 • made of one piece
- 1/04 • with guide members shaped as circular arcs
- 1/06 • consisting of two easily-separable parts

3/00 Hinges with pins

- 3/02 • with one pin
- 3/04 • • engaging three or more parts, e.g. sleeves, movable relatively to one another for connecting two or more wings to another member
- 3/06 • with two or more pins (E05D 7/08 takes precedence) [2]
- 3/08 • • for swing-doors, i.e. openable by pushing from either side
- 3/10 • • with non-parallel pins
- 3/12 • • with two parallel pins and one arm (E05D 3/08 takes precedence) [7]
- 3/14 • • with four parallel pins and two arms (E05D 3/08 takes precedence) [7]
- 3/16 • • with seven parallel pins and four arms (E05D 3/08 takes precedence) [7]
- 3/18 • • with sliding pins or guides (E05D 3/08 takes precedence) [7]

5/00 Construction of single parts, e.g. the parts for attachment

- 5/02 • Parts for attachment, e.g. flaps
- 5/04 • • Flat flaps
- 5/06 • • Bent flaps
- 5/08 • • of cylindrical shape
- 5/10 • Pins, sockets or sleeves; Removable pins (E05D 15/522 takes precedence) [2]
- 5/12 • • Securing pins in sockets, movably or not
- 5/14 • • Construction of sockets or sleeves
- 5/16 • • • to be secured without special attachment parts on the socket or sleeve

7/00 Hinges or pivots of special construction (used for special suspension arrangements E05D 15/00; so as to be self-closing E05F 1/06, E05F 1/12; with means for raising wings before being turned E05F 7/02)

- 7/02 • for use on the right-hand as well as on the left-hand side; Convertible right-hand or left-hand hinges
- 7/04 • Hinges adjustable relative to the wing or the frame
- 7/06 • to allow tilting of the members

- 7/08 • for use in suspensions comprising two spigots placed at opposite edges of the wing, especially at the top and the bottom, e.g. trunnions

- 7/081 • • the pivot axis of the wing being situated near one edge of the wing (braking devices therefor E05D 11/08) [2]

- 7/082 • • the pivot axis of the wing being situated at a considerable distance from the edges of the wing [2]

- 7/083 • • • with a fixed pivot axis [2]

- 7/084 • • • with a movable pivot axis [2]

- 7/085 • • • • with two or more pivot axes, e.g. used at the same time [2]

- 7/086 • • • Braking devices structurally combined with hinges (braking devices for windows per se E05F 5/00) [2]

- 7/10 • to allow easy separation of the parts at the hinge axis (substitutes for hinges E05D 1/06)

- 7/12 • to allow easy detachment of the hinge from the wing or the frame

- 7/14 • Hinges for safes

9/00 Flaps or sleeves specially designed for making from particular material, e.g. hoop-iron, sheet metal, plastics

11/00 Additional features or accessories of hinges

- 11/02 • Lubricating arrangements
- 11/04 • relating to the use of free balls as bearing-surfaces (E05D 7/06 takes precedence)
- 11/06 • Devices for limiting the opening movement of hinges
- 11/08 • Friction devices between relatively-movable hinge parts (E05D 7/086 takes precedence) [2]
- 11/10 • Devices for preventing movement between relatively-movable hinge parts

13/00 Accessories for sliding or lifting wings, e.g. pulleys, safety catches (counterbalance devices E05F 1/00, E05F 3/00) [4]

15/00 Suspension arrangements for wings (arrangements of wings not characterised by the construction of the supporting means E06B 3/32)

- 15/02 • for revolving wings
- 15/04 • with arms fixed on the wing pivoting about an axis outside of the wing

15/06	• for wings sliding horizontally more or less in their own plane	15/36	• moving along slide-ways so arranged that one guide member of the wing moves in a direction substantially perpendicular to the movement of another guide member
15/08	• • consisting of two or more independent parts movable each in its own guides	15/38	• • for upwardly-moving wings, e.g. up-and-over doors
15/10	• • movable out of one plane into a second parallel plane	15/40	• supported on arms movable in vertical planes
15/12	• • consisting of parts connected at their edges	15/42	• • with pivoted arms and horizontally-sliding guides
15/14	• • with movable arms situated in the plane of the wing	15/44	• • with pivoted arms and vertically-sliding guides
15/16	• for wings sliding vertically more or less in their own plane	15/46	• • with two pairs of pivoted arms
15/18	• • consisting of two or more independent parts movable each in its own guides	15/48	• allowing alternative movements (for vertically-sliding wings E05D 15/22)
15/20	• • movable out of one plane into a second parallel plane	15/50	• • for opening at either of two opposite edges
15/22	• • allowing an additional movement	15/52	• • for opening about a vertical as well as a horizontal axis
15/24	• • consisting of parts connected at their edges	15/522	• • • with disconnecting means for the appropriate pivoting parts [2]
15/26	• for folding wings	15/523	• • • using movable rods [2]
15/28	• supported on arms movable in horizontal plane	15/524	• • • Actuating mechanisms [2]
15/30	• • with pivoted arms and sliding guides	15/526	• • Safety devices [2]
15/32	• • with two pairs of pivoted arms	15/54	• • for opening both inwards and outwards
15/34	• • • with wings opening parallel to themselves	15/56	• with successive different movements
		15/58	• • with both swinging and sliding movements

E05F DEVICES FOR MOVING WINGS INTO OPEN OR CLOSED POSITION; CHECKS FOR WINGS; WING FITTINGS NOT OTHERWISE PROVIDED FOR, CONCERNED WITH THE FUNCTIONING OF THE WING

Note(s)

In this subclass, the following terms are used with the meanings indicated:

- "closer" or "opener" includes devices for assisting wing-movement or for wing-counterbalancing.

Subclass index

CLOSERS, OPENERS, OR CHECKS FOR WINGS.....	1/00, 3/00, 5/00
ACCESSORIES FOR WINGS.....	7/00
OPERATING MECHANISMS FOR WINGS.....	9/00-17/00

1/00 Closers or openers for wings, not otherwise provided for in this subclass

- 1/02 • gravity-actuated
- 1/04 • • for wings which lift during movement
- 1/06 • • • Mechanisms in the shape of hinges or pivots, operated by the weight of the wing
- 1/08 • spring-actuated
- 1/10 • • for swinging wings
- 1/12 • • • Mechanisms in the shape of hinges or pivots, operated by springs
- 1/14 • • • with double-acting springs, e.g. for closing and opening or checking and closing
- 1/16 • • for sliding wings [4]

3/00 Closers or openers with braking devices, e.g. checks; Construction of pneumatic or liquid braking devices (construction of non-pneumatic or non-liquid braking devices E05F 5/00; friction devices in hinges E05D 11/08)

- 3/02 • with pneumatic piston brakes (rotary type E05F 3/14)
- 3/04 • with liquid piston brakes (rotary type E05F 3/14)
- 3/06 • • in which a torsion spring rotates a member around an axis perpendicular to the axis of the piston

- 3/08 • • in which a torsion spring rotates a member around an axis arranged in the direction of the axis of the piston
- 3/10 • • with a spring, other than a torsion spring, and a piston, the axes of which are the same or lie in the same direction
- 3/12 • • Special devices controlling the circulation of the liquid, e.g. valve arrangement (valves per se F16K)
- 3/14 • with fluid brakes of the rotary type
- 3/16 • with friction brakes
- 3/18 • with counteracting springs (double-acting springs E05F 1/14)
- 3/20 • in hinges
- 3/22 • Additional arrangements for closers, e.g. for holding the wing in opened or other position

- 5/00 Braking devices, e.g. checks; Stops; Buffers** (construction of pneumatic or liquid braking devices E05F 3/00; combined with devices for holding wings open E05C 17/00; devices for limiting opening of wings or for holding wings open by a movable member extending between frame and wing E05C 17/04) [4]
- 5/02 • specially for preventing the slamming of wings
- 5/04 • • hand-operated; operated by centrifugal action
- 5/06 • Buffers (E05F 5/02 takes precedence)

E05F

- 5/08 • • with springs
- 5/10 • • with piston brakes
- 5/12 • specially for preventing the closing of a wing before another wing has been closed
- 7/00 Accessories for wings not provided for in other groups of this subclass** (specially adapted for furniture A47B 95/00; door-lifters B66F, E04F 21/00; knobs or handles E05B) [2]
- 7/02 • for raising wings before being turned
- 7/04 • Arrangements affording protection against rattling (with buffering action E05F 5/00)
- 7/06 • Devices for taking the weight of the wing, arranged away from the hinge axis
- 7/08 • Means for transmitting movements between vertical and horizontal sliding bars, rods, or cables (means for transmitting movements between vertical and horizontal sliding bars, rods, or cables, for the fastening of wings E05C 9/24)

Operating mechanisms for wings [2]

- 9/00 Means for operating wings by hand rods not guided in or on the frame, including those which also operate the fastening** (bolts or fastening devices for wings E05C)
- 11/00 Man-operated mechanisms for operating wings, including those which also operate the fastening** (connecting mechanisms for a plurality of wings E05F 17/00)
- 11/02 • for wings in general, e.g. fanlights (E05F 11/36 takes precedence; for windows to be lowered vertically E05F 11/38; for doors E05F 11/54)
- 11/04 • • with cords, chains, or cables
- 11/06 • • in guide-channels
- 11/08 • • with longitudinally-moving bars guided, e.g. by pivoted links, in or on the frame
- 11/10 • • • Mechanisms by which a handle moves the bar
- 11/12 • • • Mechanisms by which the bar shifts the wing
- 11/14 • • • • directly, i.e. without links, shifting the wing, e.g. by rack-and-gear or pin-and-slot
- 11/16 • • • • shifting the wing by pivotally-connected members moving in a plane perpendicular to the pivot axis of the wing
- 11/18 • • • • • consisting of a lever, e.g. an angle lever, only
- 11/20 • • • • • consisting of a lever, e.g. an angle lever, and only one additional link
- 11/22 • • • • • consisting of a lever, e.g. an angle lever, and two or more additional links in series

- 11/24 • • • • shifting the wing by pivotally-connected members moving in a plane parallel to the pivot axis of the wing
- 11/26 • • • • • consisting of a lever, e.g. an angle lever, only
- 11/28 • • • • • consisting of a lever, e.g. an angle lever, and one or more additional links
- 11/30 • • • • • consisting of links in rhomb form
- 11/32 • • with rotary bars guided in the frame (E05F 11/34 takes precedence)
- 11/34 • • with screw mechanisms
- 11/36 • specially designed for passing through a wall
- 11/38 • for sliding windows, e.g. vehicle windows, to be opened or closed by vertical movement
- 11/40 • • operated by screw mechanism
- 11/42 • • operated by rack bars and toothed wheels
- 11/44 • • operated by one or more lifting arms
- 11/46 • • operated by lazy-tongs mechanism
- 11/48 • • operated by cords or chains
- 11/50 • • Crank gear with clutches or retaining brakes, for operating window mechanisms
- 11/52 • • combined with means for producing an additional movement, e.g. a horizontal or a rotary movement
- 11/53 • for sliding windows, e.g. vehicle windows, to be opened or closed by horizontal movement [2]
- 11/54 • for doors
- 13/00 Operating mechanisms for wings, operated by the movement or weight of a person or vehicle** (through power-operated wing-operating mechanisms E05F 15/00)
- 13/02 • by devices, e.g. lever arms, affected by the movement of the user
- 13/04 • by platforms lowered by the weight of the user
- 15/00 Power-operated mechanisms for wings**
- 15/02 • with pressure medium
- 15/04 • • for swinging wings
- 15/06 • • for horizontally-sliding wings
- 15/08 • • for vertically-sliding wings
- 15/10 • with rotary electromotors
- 15/12 • • for swinging wings
- 15/14 • • for horizontally-sliding wings
- 15/16 • • for vertically-sliding wings
- 15/18 • with other electrical means, e.g. solenoids
- 15/20 • controlled by automatically-acting means, e.g. by photocells, by electric waves, by thermostats, by rain, by fire
- 17/00 Special devices for shifting a plurality of wings operated simultaneously** (for simultaneously moving a plurality of interconnected ventilating lamellae E06B 7/086) [2]

E05G SAFES OR STRONG-ROOMS FOR VALUABLES; BANK PROTECTION DEVICES; SAFETY TRANSACTION PARTITIONS (alarm arrangements per se G08B) [2]

Note(s)

In this subclass, the following terms or expressions are used with the meanings indicated:

- "bank" is a building or portion of a building devoted to the safekeeping or exchange of valuables between the "bank" and its customers;
- "bank protection device" is a mechanism in or on a bank for protecting the valuables or repelling attacks by stealth or force.

1/00 Safes or strong-rooms for valuables (savings boxes

A45C 1/12; floatable safes B63C 7/30; storage

- containers without attack or fire repellent features B65D; bank buildings in general, e.g. modular construction, floor plan, E04H 1/06; buildings resistant to earthquake or war action E04H 9/00)
- 1/02 • Details (safe hinges E05D 7/14)
 - 1/024 • • Wall or panel structure [2]
 - 1/026 • • Closures (protective doors, windows, or like closures against air-raid or other war-like action E06B 5/10; shutters, movable grilles, other safety closures E06B 9/02) [2]
 - 1/04 • • Closure fasteners (locks E05B)
 - 1/06 • having provision for multiple compartments [2]
 - 1/08 • • secured individually [2]
 - 1/10 • with alarm, signal, or indicator (burglar, theft, or intruder alarm per se G08B 13/00; fire or explosion alarm per se G08B 17/00) [2]
 - 1/12 • with fluent-material releasing, generating, or distributing means, e.g. repellent or fire extinguishing (E05G 1/14 takes precedence; identifying, scaring or incapacitating burglars, thieves, or intruders with smoke, gas, powder, or liquid G08B 15/02) [2, 6]
 - 1/14 • with means for marking or destroying the valuables, e.g. in case of theft [6]
 - 5/00 **Bank protection devices** (E05G 1/12, E05G 7/00 take precedence; closed-circuit television systems H04N 7/18) [2]
 - 5/02 • Trapping or confining mechanisms (thief or burglar incapacitating means in general G08B 15/00) [2]
 - 7/00 **Safety transaction partitions, e.g. movable payplates** (non-safety paying counters, e.g. for supermarkets, A47F 9/02) [2]

E06 DOORS, WINDOWS, SHUTTERS, OR ROLLER BLINDS, IN GENERAL; LADDERS

E06B FIXED OR MOVABLE CLOSURES FOR OPENINGS IN BUILDINGS, VEHICLES, FENCES, OR LIKE ENCLOSURES, IN GENERAL, e.g. DOORS, WINDOWS, BLINDS, GATES (shades or blinds for greenhouses A01G 9/22; curtains A47H; lids for car boots or bonnets B62D 25/10; sky-lights E04B 7/18; sunshades, awnings E04F 10/00)

Note(s)

1. This subclass does not cover combinations of wings or frames with operating, mounting, latching or locking means of the type found in class E05, which are covered by the relevant subclasses of class E05, except such as are covered by groups E06B 7/086, E06B 9/00, or E06B 11/02 of this subclass.
2. In this subclass, the following terms or expressions are used with the meanings indicated:
 - "wing" means a swingable, slidable or otherwise movable member such as a door or window, for closing an opening;
 - "wing frame" means the peripheral edge or edges which define the outer border of the wing.
3. For vehicle door or window arrangements, attention is drawn to Note (1) following the title of subclass B60J.

Subclass index

BORDER CONSTRUCTIONS.....	1/00
ELEMENTS FOR CLOSING OPENINGS.....	3/00, 5/00
SPECIAL ARRANGEMENTS.....	7/00, 9/00
MEANS ALLOWING PASSAGE THROUGH FENCES.....	11/00

- 1/00 **Border constructions of openings in walls, floors, or ceilings; Frames to be rigidly mounted in such openings** (E06B 5/00 takes precedence; features relating also to inner frames or wing frames, features relating solely to the mounting of inner frames E06B 3/00; corner joints or edge joints E06B 3/96) [4]
 - 1/02 • Base frames, i.e. template frames for openings in walls or the like, provided with means for securing a further rigidly-mounted frame; Special adaptations of frames to be fixed therein
 - 1/04 • Frames for doors, windows, or the like to be fixed in openings (special adaptations for fixing in base frames E06B 1/02; features relating solely to the mounting of glass panes or other sheets E06B 3/00)
 - 1/06 • • Wooden frames
 - 1/08 • • • composed of several parts with respect to the cross-section of the frame itself
 - 1/10 • • • adjustable with respect to the thickness of walls
 - 1/12 • • Metal frames
 - 1/14 • • • of special cross-section (E06B 1/18, E06B 1/22 take precedence)
 - 1/16 • • • • Hollow frames
 - 1/18 • • • composed of several parts with respect to the cross-section of the frame itself
 - 1/20 • • • • adjustable with respect to the thickness of walls
 - 1/22 • • • with integral thresholds of special form
 - 1/24 • • Frames of natural stone, concrete, or other stone-like material
 - 1/26 • • Frames of plastics
 - 1/28 • • • Hollow frames (E06B 1/30 takes precedence)
 - 1/30 • • • composed of several parts with respect to the cross-section of the frame itself
 - 1/32 • • Frames composed of parts made of different materials
 - 1/34 • • Coverings, e.g. protecting against weather, for decorative purposes
 - 1/36 • • Frames uniquely adapted for windows
 - 1/38 • • • for shop-, show- or like large windows
 - 1/40 • • • Frames with parts removable to admit the glass (E06B 1/38 takes precedence)
 - 1/52 • • Frames specially adapted for doors
 - 1/56 • Fastening frames to the border of openings

- 1/58 • • by filling-up the joints, e.g. by cementing
- 1/60 • • by mechanical means, e.g. anchoring means
- 1/62 • Tightening or covering joints between the border of openings and the frame (E06B 1/34 takes precedence)
- 1/64 • • by loosely-inserted means, e.g. strip, resilient tongue
- 1/66 • • by labyrinth packings
- 1/68 • • by profiled external parts
- 1/70 • Sills; Thresholds
- 3/00 Window sashes, door leaves, or like elements for closing openings; Layout of fixed or moving closures, e.g. windows; Features of rigidly-mounted outer frames relating to the mounting of wing frames** (E06B 5/00 takes precedence; shutters or the like E06B 9/00; glass panes C03; uniting glass sheets by fusion C03B 23/203; joining glass to glass other than by fusing or to other inorganic material C03C 27/00)
- 3/01 • Removable or disappearing walls for hangars or other halls, e.g. for aircraft (wall constructions E04B 2/00)
- 3/02 • Wings made completely of glass
- 3/04 • Wing frames not characterised by the manner of movement (features relating to the manner of movement E06B 3/32)
- 3/06 • • Single frames
- 3/08 • • • Constructions depending on the use of specified materials (E06B 3/24 takes precedence)
- 3/10 • • • • of wood
- 3/12 • • • • of metal
- 3/14 • • • • • of special cross-section
- 3/16 • • • • • Hollow frames
- 3/18 • • • • • of concrete or other stone-like material
- 3/20 • • • • • of plastics
- 3/22 • • • • • Hollow frames
- 3/24 • • • specially adapted for double glazing (separable parts for securing panes E06B 3/64)
- 3/26 • • Compound frames, i.e. one frame within or behind another (E06B 3/263, E06B 3/28 take precedence; arrangements of movable frames E06B 3/32)
- 3/263 • • Frames with special provision for insulation [6]
- 3/267 • • • with insulating elements formed in situ [6]
- 3/273 • • • with prefabricated insulating elements held in position by deformation of portions of the frame members [6]
- 3/277 • • • with prefabricated insulating elements held in position by expansion of the insulating elements [6]
- 3/28 • • with additional removable glass panes or the like, framed or unframed
- 3/30 • Coverings, e.g. protecting against weather, for decorative purposes
- 3/32 • Arrangements of wings characterised by the manner of movement; Arrangements of movable wings in openings; Features of wings or frames relating solely to the manner of movement of the wing [3]
- 3/34 • • with only one kind of movement (E06B 3/48 takes precedence)
- 3/36 • • • with a single vertical axis of rotation at one side of the opening, or swinging through the opening (wings requiring lifting before opening E06B 3/52)
- 3/38 • • • with a horizontal axis of rotation at the top or bottom of the opening
- 3/40 • • • with a vertical or horizontal axis of rotation not at one side of the opening, e.g. turnover wings
- 3/42 • • • Sliding wings; Details of frames with respect to guiding
- 3/44 • • • • Vertically-sliding wings
- 3/46 • • • • Horizontally-sliding wings
- 3/48 • • Wings connected at their edges, e.g. foldable wings
- 3/50 • • with more than one kind of movement (E06B 3/48 takes precedence)
- 3/52 • • • Wings requiring lifting before opening
- 3/54 • Fixing of glass panes or like plates
- 3/56 • • by means of putty, cement, or adhesives only (E06B 3/64 takes precedence)
- 3/58 • • by means of borders, cleats, or the like (E06B 3/64 takes precedence)
- 3/60 • • • of clamping cleats of metal
- 3/62 • • • of rubber-like elastic cleats
- 3/64 • • Fixing of more than one pane to a frame
- 3/66 • Units comprising two or more parallel glass or like panes in spaced relationship, the panes being permanently secured together, e.g. along the edges (layered products essentially comprising sheet glass B32B 17/00; coating of glass C03C 17/00)
- 3/663 • • Elements for spacing panes [6]
- 3/667 • • • Connectors therefor [6]
- 3/67 • • characterised by additional arrangements or devices for heat or sound insulation [6]
- 3/673 • • Assembling the units (E06B 3/677 takes precedence) [6]
- 3/677 • • Evacuating or filling the gap between the panes; Preventing condensation in the gap between the panes (by means of spacing elements E06B 3/663); Cleaning the gap between the panes [6]
- 3/68 • Window bars
- 3/70 • Door leaves (wing frames E06B 3/04)
- 3/72 • • consisting of frame and panels
- 3/74 • • • with wooden panels
- 3/76 • • • with metal panels
- 3/78 • • • with panels of plastics
- 3/80 • • flexible
- 3/82 • • Flush doors, i.e. with completely flat surface (E06B 3/02 takes precedence)
- 3/84 • • • of plywood
- 3/86 • • • of plastics
- 3/88 • • Edge-protecting devices for door leaves (finger guards for doors or windows E06B 7/36)
- 3/90 • Revolving doors; Cages or housings therefor (turnstiles E06B 11/08)
- 3/92 • Doors or windows extensible when set in position (sliding wings for windows E06B 3/42; foldable wings E06B 3/48; wall-closing devices which may be rolled up, e.g. shutters, E06B 9/08)
- 3/94 • • Doors of the bellows type
- 3/96 • Corner joints or edge joints for windows, doors, or the like frames or wings [4]
- 3/964 • • using separate connecting pieces, e.g. T-connecting pieces (E06B 3/984, E06B 3/988, E06B 3/99 take precedence) [5]
- 3/968 • • • characterised by the way the connecting pieces are fixed in or on the frame members [5]
- 3/972 • • • • by increasing the cross-section of the connecting pieces, e.g. by expanding the connecting pieces with wedges (E06B 3/976 takes precedence) [5]
- 3/976 • • • • by deformation of the frame members [5]

- 3/98 • • • the connecting pieces being specially adapted for drawing the frame members towards each other (E06B 3/972, E06B 3/976 take precedence) [5]
- 3/984 • • specially adapted for frame members of wood or other material worked in a similar way (E06B 3/99 takes precedence) [5]
- 3/988 • • specially adapted for frame members of sheet metal, or similar sheet material, with an open generally U-shaped cross-section, e.g. for door frame members [5]
- 3/99 • • for continuous frame members crossing each other without interruption (window bars E06B 3/68) [5]
- 5/00 Doors, windows, or like closures for special purposes; Border constructions therefor**
- 5/01 • Trap-doors
- 5/02 • for out-buildings or cellars; Other simple closures not designed to be close-fitting
- 5/04 • • with fixed wooden frames
- 5/06 • • with fixed metal frames
- 5/08 • • with fixed frames made of concrete, stone-like material, or plastics
- 5/10 • for protection against air-raid or other war-like action; for other protective purposes
- 5/11 • • against burglary [6]
- 5/12 • • against air pressure, explosion, or gas
- 5/14 • • • Gasproof doors or similar closures; Adaptation of fixed constructions therefor
- 5/16 • • Fireproof doors or similar closures; Adaptations of fixed constructions therefor
- 5/18 • • against harmful radiation (against heat E06B 5/16)
- 5/20 • for insulation against noise
- 7/00 Special arrangements or measures in connection with doors or windows (screening or similar protective devices E06B 9/00)**
- 7/02 • for providing ventilation, e.g. through double windows; Arrangement of ventilation roses (airflow control members *per se* F24F 13/08)
- 7/03 • • Ventilating devices for inserting under upwardly-sliding windows (rain or draught deflectors E06B 7/26)
- 7/04 • • with ventilation wings (E06B 7/08 takes precedence)
- 7/06 • • • with one ventilation wing only
- 7/08 • • Louvre doors, windows, or grilles
- 7/082 • • • with rigid or slidable lamellae
- 7/084 • • • with rotatable lamellae
- 7/086 • • • • interconnected for concurrent movement [2]
- 7/088 • • • • with facing protective grille or safety guard [2]
- 7/09 • • • • mounted in movable wing, e.g. door [2]
- 7/092 • • • • operable in two or more distinct sets [2]
- 7/094 • • • • operable in sequence; characterised by additional independent movement [2]
- 7/096 • • • • operated or interconnected by gearing (wing operators with gearing in general E05F 11/00) [2]
- 7/098 • • • • with weather seal [2]
- 7/10 • • by special construction of the frame members
- 7/12 • Measures preventing the formation of condensed water (double glazing E06B 3/24-E06B 3/28, E06B 3/64, E06B 3/66; heating arrangements specially adapted for transparent or reflecting areas H05B 3/84)
- 7/14 • Measures for draining-off condensed water or water leaking-in
- 7/16 • Sealing arrangements on wings or parts co-operating with the wings (E06B 7/098 takes precedence) [2]
- 7/18 • • by means of movable edgings, e.g. draught sealings additionally used for bolting
- 7/20 • • • automatically withdrawn when the wing is opened
- 7/205 • • • • with sealing strip mounted on sill [2]
- 7/21 • • • • with sealing strip movable in plane of wing [2]
- 7/215 • • • • with sealing strip being moved to a retracted position by elastic means, e.g. springs [2]
- 7/22 • • by means of elastic edgings, e.g. elastic rubber tubes; by means of resilient edgings, e.g. felt or plush strips, resilient metal strips (E06B 7/18 takes precedence)
- 7/23 • • • Plastic, sponge rubber, or like strips or tubes
- 7/232 • • • Resilient strips of hard material, e.g. metal
- 7/24 • • without separate sealing members, e.g. with labyrinth
- 7/26 • Rain or draught deflectors, e.g. under sliding wings
- 7/28 • Other arrangements on doors or windows, e.g. door-plates, windows adapted to carry plants, hooks for window cleaners
- 7/30 • • Peep-holes; Devices for speaking through; Doors having windows
- 7/32 • • Serving doors; Passing-through doors
- 7/34 • • Doors containing cupboards (cabinets in general A47B)
- 7/36 • • Finger guards [7]
- 9/00 Screening or protective devices for openings, with or without operating or securing mechanisms; Closures of similar construction (E06B 5/10 takes precedence; wings for doors or windows, connected at their edges, E06B 3/48; additional indoor equipment of doors or windows, not forming part of the proper finishing work of a building, e.g. curtains, A47H; gratings as building elements E04C 2/42; locks, accessories therefor E05B; bolts or fastening devices for wings E05C; operating mechanism for wings in general E05F)**
- 9/01 • Grilles fixed to walls, doors, or windows; Grilles moving with doors or windows; Walls formed as grilles, e.g. claustra
- 9/02 • Shutters, movable grilles, or other safety closing devices, e.g. against burglary (louvre windows or grilles E06B 7/08; lamellar blinds E06B 9/26)
- 9/04 • • of wing type, e.g. revolving or sliding
- 9/06 • • collapsible or foldable, e.g. of the bellows or lazy-tongs type (bellows-type doors E06B 3/94; roll-type grilles E06B 9/18)
- 9/08 • • Roll-type closures (roller blinds E06B 9/40; operating, guiding or securing devices or arrangements for roll-type closures E06B 9/56; usable only as awnings E04F 10/06) [5]
- 9/11 • • • Roller shutters [5]
- 9/13 • • • • with closing members of one piece, e.g. of corrugated sheet metal [5]
- 9/15 • • • • with closing members formed of slats or the like [5]
- 9/165 • • • • with slats disappearing in each other; with slats the distance between which can be altered [5]
- 9/17 • • • • Parts or details of roller shutters, e.g. suspension devices, shutter boxes, wicket doors, ventilation openings [5]

- 9/171 • • • • • Rollers therefor; Fastening roller shutters to rollers [5]
- 9/172 • • • • • • by clamping bars
- 9/173 • • • • • • by clasps or buttons
- 9/174 • • • • • Bearings specially adapted therefor [5]
- 9/18 • • • Roll-type grilles [5]
- 9/24 • Screens or other constructions affording protection against light, especially against sunshine; Similar screens for privacy or appearance (operating, guiding or securing devices or arrangements for roll-type closures E06B 9/56; free-hanging flexible screens A47H 23/00)
- 9/26 • • Lamellar or like blinds, e.g. venetian blinds
- 9/262 • • • with flexibly-interconnected horizontal or vertical strips; Concertina blinds
- 9/264 • • • Combinations of lamellar blinds with roller shutters, screen windows, windows, or double panes; Lamellar blinds with special devices
- 9/266 • • • Devices or accessories for making or mounting lamellar blinds or parts thereof [3]
- 9/28 • • • with horizontal lamellae, e.g. non-liftable (louvre windows or gratings E06B 7/08)
- 9/30 • • • • liftable
- 9/302 • • • • • without ladder-tape, e.g. with lazy-tongs, with screw spindle
- 9/303 • • • • • with ladder-tape
- 9/304 • • • • • • with tilting bar and separate raising shaft
- 9/305 • • • • • • with tilting bar and raising cords guided along fixed bar
- 9/306 • • • • • • with tilting bar along which the raising cords are guided
- 9/307 • • • • • • Details of tilting bars or their operation
- 9/308 • • • • • • with coaxial tilting bar and raising shaft
- 9/32 • • • • • Operating, guiding, or securing devices therefor (operation of tilting bars E06B 9/307)
- 9/322 • • • • • • Details of operating devices, e.g. pulleys, brakes, spring drums, drives (devices of general interest specially adapted or mounted for storing and repeatedly paying-out and re-storing lengths of material B65H 75/34)
- 9/323 • • • • • • Structure or support of upper box
- 9/324 • • • • • • Cord-locks
- 9/325 • • • • • • Immobilising devices preventing raising
- 9/326 • • • • • • Details of cords, e.g. buckles, drawing knobs
- 9/327 • • • • • • Guides for raisable lamellar blinds with horizontal lamellae
- 9/34 • • • • roller type
- 9/36 • • • with vertical lamellae
- 9/38 • • • Other details
- 9/382 • • • • Details of ladder-tapes or ladder-chains, e.g. buckles for local shortening of tapes
- 9/384 • • • • Details of interconnection or interaction of tapes and lamellae
- 9/386 • • • • Details of lamellae
- 9/388 • • • • Details of bottom or upper slats or their attachment
- 9/40 • • Roller blinds (usable only as awnings E04F 10/06) [5]
- 9/42 • • • Parts or details of roller blinds, e.g. suspension devices, blind boxes (brackets or adjustable mountings for roller blinds and drawable curtains A47H 1/13) [5]
- 9/44 • • • • Rollers therefor; Fastening roller blinds to rollers [5]
- 9/46 • • • • • by clamping bars [5]
- 9/48 • • • • • by clasps or buttons [5]
- 9/50 • • • • Bearings specially adapted therefor [5]
- 9/52 • Devices affording protection against insects, e.g. fly screens; Mesh windows for other purposes
- 9/54 • • Roller fly screens (operating, guiding or securing devices therefor E06B 9/56) [2, 5]
- 9/56 • Operating, guiding or securing devices or arrangements for roll-type closures; Spring drums; Tape drums; Counterweighting arrangements therefor (devices of general interest specially adapted or mounted for storing and repeatedly paying-out and re-storing lengths of material B65H 75/34) [5]
- 9/58 • • Guiding devices [5]
- 9/60 • • Spring drums operated only by closure members [5]
- 9/62 • • Counterweighting arrangements (E06B 9/60 takes precedence) [5]
- 9/64 • • with lowerable roller [5]
- 9/66 • • with a roller situated at the bottom [5]
- 9/68 • • Operating devices or mechanisms, e.g. with electric drive [5]
- 9/70 • • • comprising an electric motor positioned outside the roller [5]
- 9/72 • • • comprising an electric motor positioned inside the roller [5]
- 9/74 • • • adapted for selective electrical or manual operation [5]
- 9/76 • • • using crank handles [5]
- 9/78 • • for direct manual operation, e.g. by tassels, by handles [5]
- 9/80 • • Safety measures against dropping or unauthorised opening; Braking or immobilising devices; Devices for limiting unrolling (securing devices or arrangements for direct manual operation E06B 9/78) [5]
- 9/82 • • • automatic [5]
- 9/84 • • • • against dropping [5]
- 9/86 • • • • against unauthorised opening [5]
- 9/88 • • • • for limiting unrolling [5]
- 9/90 • • • • for immobilising the closure member in various chosen positions [5]
- 9/92 • • Means allowing the closures to be shifted out of the plane of the opening [5]
- 11/00 Means for allowing passage through fences, barriers, or the like, e.g. stiles (general features of doors E06B 1/00-E06B 9/00)**
- 11/02 • Gates; Doors
- 11/04 • • characterised by the kind of suspension (suspensions *per se* E05D)
- 11/06 • • characterised by the kind of fastening (fastening devices for wings E05C)
- 11/08 • Turnstiles (on vehicles B60N 5/00; with registering means G07C 9/02)

E06C LADDERS (E04F 11/00 takes precedence; step-stools A47C 12/00; adaptation of ladders to use on ships B63B, to use on aircraft B64; scaffolding E04G) [5, 6]

- 1/00 Ladders in general** (mounted on undercarriages or vehicles E06C 5/00; permanently attached to fixed structures E06C 9/00)
- 1/02 • with rigid longitudinal member or members
 - 1/04 • • Ladders for resting against objects, e.g. walls, poles, trees (supports for ladder heads E06C 7/48)
 - 1/06 • • • in one piece
 - 1/08 • • • multi-part
 - 1/10 • • • • Sections fitted end to end
 - 1/12 • • • • extensible, e.g. telescopic
 - 1/14 • • Ladders capable of standing by themselves
 - 1/16 • • • with struts which rest on the ground (with struts rigid with the ladder E06C 1/24; having platforms E06C 1/39)
 - 1/18 • • • • with supporting struts formed as ladders
 - 1/20 • • • • with supporting struts formed as poles
 - 1/22 • • • • • with extensible, e.g. telescopic, ladder parts or struts
 - 1/24 • • • Free-standing ladders
 - 1/26 • • • in one piece
 - 1/28 • • • • multi-part (with movable supporting struts formed as ladders E06C 1/18)
 - 1/30 • • • • • extensible, e.g. telescopic
 - 1/32 • • Ladders with a strut which is formed as a ladder and can be secured in line with the ladder
 - 1/34 • • Ladders attachable to structures, such as windows, cornices, poles, or the like (ladders permanently fastened to buildings E06C 9/00)
 - 1/36 • • • Ladders suspendable by hooks or the like
 - 1/38 • • Special constructions of ladders, e.g. ladders with more or less than two longitudinal members, ladders with movable rungs or other treads, longitudinally-foldable ladders
 - 1/383 • • • Foldable ladders in which the longitudinal members are brought together on folding
 - 1/387 • • • having tip-up steps
 - 1/39 • • • Ladders having platforms; Ladders changeable into platforms (platforms for use on ladders E06C 7/16)
 - 1/393 • • • • Ladders having platforms foldable with the ladder
 - 1/397 • • • characterised by having wheels, rollers, or runners
 - 1/52 • with non-rigid longitudinal members
 - 1/54 • • of the lazy-tongs type
 - 1/56 • • Rope or chain ladders
 - 1/58 • with both rigid and non-rigid longitudinal members
- 5/00 Ladders characterised by being mounted on undercarriages or vehicles; Securing ladders on vehicles** (ladders having wheels, rollers, or runners E06C 1/397)
- 5/02 • with rigid longitudinal members
 - 5/04 • • capable of being elevated or extended
 - 5/06 • • • by piston and cylinder, or equivalent means, operated by a pressure medium
 - 5/08 • • • • derived directly from a pressure reservoir
 - 5/10 • • • • • charged by a pump or compressor driven by the motor of the vehicle or another motor on the vehicle
 - 5/12 • • • • derived directly from a pump or compressor
- 5/14 • • • • • driven by the motor of the vehicle or another motor on the vehicle
 - 5/16 • • • using mechanical transmission only, with or without fluid or other non-mechanical couplings or clutches
 - 5/18 • • • • using power from the motor of the vehicle or another motor
 - 5/20 • • • • using hand-power (hand-operated extending means carried by the ladder E06C 7/04)
 - 5/22 • • • by, or with the assistance of, springs (E06C 5/06, E06C 5/16 take precedence)
 - 5/24 • • Dismounting ladders from vehicles
 - 5/26 • with non-rigid longitudinal members
 - 5/28 • • of the lazy-tongs type
 - 5/30 • • formed of links which reinforce themselves against each other
 - 5/32 • Accessories
 - 5/34 • • Indicating devices
 - 5/36 • • Safety devices against slipping or falling of ladders; Safety devices against overloading ladders
 - 5/38 • • Devices for blocking the springs of the vehicle; Devices for supporting the undercarriage directly from the ground
 - 5/40 • • Devices for canting ladders laterally
 - 5/42 • • Devices for altering inclination; Latching devices therefor
 - 5/44 • • Other accessories on ladders, e.g. acoustical signalling devices, dismountable switchboards
- 7/00 Component parts, supporting parts, or accessories**
- 7/02 • Extending means (for ladders mounted on undercarriages or vehicles E06C 5/00)
 - 7/04 • • Hand-operated extending means carried by the ladder
 - 7/06 • Securing devices or hooks for parts of extensible ladders
 - 7/08 • Special construction of longitudinal members, or rungs or other treads
 - 7/10 • Reinforcements for ladders
 - 7/12 • Lifts or other hoisting devices on ladders
 - 7/14 • Holders for pails or other equipment on or for ladders
 - 7/16 • Platforms on, or for use on, ladders, e.g. liftable or lowerable platforms (aspects relating to the lifting B66F)
 - 7/18 • Devices for preventing persons from falling (life-saving belts A62B 1/16)
 - 7/42 • Ladder feet; Supports therefor (for scaffold elements E04G 5/02)
 - 7/44 • • Means for mounting ladders on uneven ground
 - 7/46 • • Non-skid equipment
 - 7/48 • Ladder heads; Supports for heads of ladders for resting against objects
 - 7/50 • Joints or other connecting parts
- 9/00 Ladders characterised by being permanently attached to fixed structures, e.g. fire escapes** (movable stairways E04F 11/04)
- 9/02 • rigidly mounted
 - 9/04 • • in the form of climbing irons or the like
 - 9/06 • movably mounted
 - 9/08 • • with rigid longitudinal members

E06C

- 9/10

-
 -
 - forming part of a building, such as a balcony grid, window grid, or other window part
- 9/12

-
 -
 - laterally displaceable
- 9/14

-
 - with non-rigid longitudinal members, e.g. rope or chain ladders, ladders of the lazy-tongs type

EARTH OR ROCK DRILLING; MINING

E21 EARTH OR ROCK DRILLING; MINING

Note(s)

In this class, the following term is used with the meaning indicated:

- "drilling" covers boring and *vice versa*.

E21B EARTH OR ROCK DRILLING (mining, quarrying E21C; making shafts, driving galleries or tunnels E21D); OBTAINING OIL, GAS, WATER, SOLUBLE OR MELTABLE MATERIALS OR A SLURRY OF MINERALS FROM WELLS [5]

Note(s)

1. This subclass covers:
 - primarily equipment for drilling of earth or rock in their natural formation;
 - similar equipment for drilling of man-made structures in situ, e.g. of road surfaces or concrete structures.
2. This subclass does not cover:
 - hand-held drilling machines, e.g. for domestic use;
 - drilling equipment for manufacturing operations, i.e. where an article is worked, e.g. for further processing;
 which are covered by relevant subclasses of section B, e.g. B23B;
 - compositions for drilling of boreholes or wells or for treating boreholes or wells, which compositions are covered by group C09K 8/00, e.g. compositions for enhanced recovery methods for obtaining hydrocarbons C09K 8/58.
3. Processes using enzymes or micro-organisms in order to:
 - i. liberate, separate or purify a pre-existing compound or composition, or to
 - ii. treat textiles or clean solid surfaces of materials
 are further classified in subclass C12S.

Subclass index

METHODS OR APPARATUS FOR DRILLING.....	1/00-7/00
DRILLING TOOLS; ACCESSORIES THEREFOR.....	10/00, 11/00, 12/00
OTHER EQUIPMENT OR DETAILS FOR DRILLING; WELL EQUIPMENT OR MAINTENANCE	
Derricks; drilling rods or the like.....	15/00, 17/00, 19/00
Flushing or cleaning; sealing; heating or cooling.....	21/00, 37/00, 33/00, 36/00
Valve arrangements; fire-fighting.....	34/00, 35/00
Other equipment or details.....	23/00-31/00, 40/00, 41/00
OBTAINING FLUIDS FROM WELLS.....	43/00
CONTROL; SURVEYING OR TESTING.....	44/00, 45/00-49/00

Methods or apparatus for drilling

1/00 Percussion drilling (drives used in the borehole E21B 4/00) [3]	1/26 • • • by liquid pressure [7]
1/02 • Surface drives for drop hammers, e.g. with a cable [1, 7]	1/28 • • • • working with pulses [7]
1/04 • • Devices for reversing the movement of the rod or cable at the surface	1/30 • • • by air, steam or gas pressure [7]
1/12 • with a reciprocating impulse member (E21B 1/02, E21B 1/38 take precedence) [7]	1/32 • • • • working with pulses [7]
1/14 • • driven by a rotating mechanism [7]	1/34 • • • • the impulse member being a piston of an internal-combustion engine [7]
1/16 • • • with spring-mounted reciprocating masses, e.g. with air cushion [7]	1/36 • Tool-carrier piston type, i.e. in which the tool is connected to an impulse member [7]
1/18 • • • • with elastic joining of the drive to the push-rod by double buffer springs [7]	1/38 • Hammer piston type, i.e. in which the tool bit or anvil is hit by an impulse member [7]
1/20 • • • formed as centrifugal hammers [7]	3/00 Rotary drilling (drives used in the borehole E21B 4/00; rotary drilling machines in general B23B) [3]
1/22 • • driven by electromagnets [7]	3/02 • Surface drives for rotary drilling
1/24 • • the impulse member being a piston driven directly by fluid pressure [7]	3/025 • • with a to-and-fro rotation of the tool [7]
	3/03 • • with an intermittent unidirectional rotation of the tool [7]
	3/035 • • with slipping or elastic transmission [7]
	3/04 • • Rotary tables

- 3/06 • • • Adaptation of rotary draw works to drive rotary tables (connecting or disconnecting couplings or joints E21B 19/16; rope, cable, or chain winding mechanisms, capstans B66D) [3]

4/00 Drives for drilling, used in the borehole [3]

- 4/02 • Fluid rotary type drives (hydraulic turbines for drilling wells F03B 13/02) [3]
- 4/04 • Electric drives (E21B 4/12 takes precedence) [3]
- 4/06 • Down-hole impacting means, e.g. hammers (percussion drill bits E21B 10/36; boring rams E21B 11/02; releasing-jars E21B 31/107) [3]
- 4/08 • • impact being obtained by gravity only, e.g. with lost-motion connection [3]
- 4/10 • • continuous unidirectional rotary motion of shaft or drilling pipe effecting consecutive impacts [3]
- 4/12 • • Electrically operated hammers [3]
- 4/14 • • Fluid operated hammers [3]
- 4/16 • Plural down-hole drives, e.g. for combined percussion and rotary drilling (E21B 4/10 takes precedence); Drives for multi-bit drilling units [3]
- 4/18 • Anchoring or feeding in the borehole [3, 7]
- 4/20 • combined with surface drive (E21B 4/10 takes precedence) [3]

6/00 Drives for drilling with combined rotary and percussive action (drives used in the borehole E21B 4/00; portable percussive machines with superimposed rotation B25D 16/00) [3]

- 6/02 • the rotation being continuous [7]
- 6/04 • • Separate drives for percussion and rotation [7]
- 6/06 • the rotation being intermittent, e.g. obtained by a ratchet device [7]
- 6/08 • • Separate drives for percussion and rotation [7]

7/00 Special methods or apparatus for drilling (supports for the drilling machine, e.g. derricks or masts, E21B 15/00) [1, 7]

- 7/02 • Drilling rigs characterised by means for land transport, e.g. skid mounting or wheel mounting (portable drilling rigs for use on underwater floors E21B 7/124) [1, 7]
- 7/04 • Directional drilling
- 7/06 • • Deflecting the direction of boreholes
- 7/08 • • • Special apparatus for deflecting the boring, e.g. special drill bits, knuckle joints, whipstocks (directional window cutting E21B 29/06; deflecting the direction of fishing tools E21B 31/14)
- 7/10 • • Correction of deflected boreholes
- 7/12 • Underwater drilling (telescoping joints E21B 17/07; using heave compensators E21B 19/09; well heads specially adapted for underwater installations E21B 33/035) [1, 7]
- 7/124 • • with underwater tool drive prime mover, e.g. portable drilling rigs for use on underwater floors [3]
- 7/128 • • from floating support with independent underwater anchored guide base [3]
- 7/132 • • from underwater buoyant support [3]
- 7/136 • • from non-buoyant support (E21B 7/124 takes precedence) [3]
- 7/14 • Drilling by use of heat, e.g. flame drilling
- 7/15 • • of electrically generated heat [3]
- 7/16 • Applying separate balls or pellets by the pressure of the drill, so-called shot-drilling

- 7/18 • Drilling by liquid or gas jets, with or without entrained pellets (E21B 7/14 takes precedence; hydraulic monitors E21C 45/00) [5]
- 7/20 • Driving or forcing casings or pipes into boreholes, e.g. sinking; Simultaneously drilling and casing boreholes (surface means for applying to-and-fro rotation movements to the casing E21B 3/025; placing piles E02D 7/00; sinking shafts while moving the lining downwards E21D 1/08) [3]
- 7/24 • Drilling using vibrating or oscillating means, e.g. out-of-balance masses (percussion drilling E21B 1/00) [3]
- 7/26 • Drilling without earth removal, e.g. with self-propelled burrowing devices (E21B 7/30 takes precedence; down-hole drives E21B 4/00) [3, 6]
- 7/28 • Enlarging drilled holes, e.g. by counterboring (drill bits for enlarging the borehole E21B 10/26) [3]
- 7/30 • • without earth removal [6]

Drilling tools

10/00 Drill bits (specially adapted for deflecting the direction of boring E21B 7/08; with means for collecting substances E21B 27/00) [3, 2006.01]

- 10/02 • Core bits (characterised by wear resisting parts E21B 10/46; obtaining undisturbed cores E21B 25/00) [3]
- 10/04 • • with core destroying means [3]
- 10/06 • • Roller core bits [3]
- 10/08 • Roller bits (roller core bits E21B 10/06; with leading portion E21B 10/26; characterised by wear resisting parts E21B 10/46) [3]
- 10/10 • • with roller axle supported at both ends (with disc cutters E21B 10/12) [3]
- 10/12 • • with disc cutters [3]
- 10/14 • • combined with non-rolling cutters other than of leading-portion type [3]
- 10/16 • • characterised by tooth form or arrangement [3]
- 10/18 • • characterised by conduits or nozzles for drilling fluids (drilling fluid supply to the bearings E21B 10/23) [3, 2006.01]
- 10/20 • • characterised by detachable or adjustable parts, e.g. legs or axles (cross axle roller bits E21B 10/10) [3]
- 10/22 • • characterised by bearing, lubrication or sealing details [3, 2006.01]
- 10/23 • • • with drilling fluid supply to the bearings [2006.01]
- 10/24 • • • characterised by lubricating details (E21B 10/23 takes precedence) [3, 2006.01]
- 10/25 • • • characterised by sealing details [2006.01]
- 10/26 • Drill bits with leading portion, i.e. drill bits with a pilot cutter; Drill bits for enlarging the borehole, e.g. reamers (percussion drill bits with leading portion E21B 10/40; augers with leading portion E21B 10/44) [3]
- 10/28 • • with non-expansible roller cutters [3]
- 10/30 • • • Longitudinal axis roller reamers, e.g. reamer stabilisers [3]
- 10/32 • • with expansible cutting tools [3]
- 10/34 • • • of roller-cutter type [3]
- 10/36 • Percussion drill bits (characterised by wear resisting parts E21B 10/46) [3]
- 10/38 • • characterised by conduits or nozzles for drilling fluids [3]
- 10/40 • • with leading portion [3]

- 10/42 • Rotary drag type drill bits with teeth, blades or like cutting elements, e.g. fork-type bits, fish tail bits (characterised by wear resisting parts E21B 10/46, by conduits or nozzles for drilling fluid E21B 10/60, by detachable parts E21B 10/62) [3, 2006.01]
- 10/43 • • characterised by the arrangement of teeth or other cutting elements [2006.01]
- 10/44 • Bits with helical conveying portion, e.g. screw type bits; Augers with leading portion or with detachable parts (E21B 10/42 takes precedence; drilling rods with helical structure E21B 17/22) [3, 2006.01]
- 10/46 • characterised by wear resisting parts, e.g. diamond inserts [3]
- 10/48 • • the bit being of core type [3]
- 10/50 • • the bit being of roller type [3]
- 10/52 • • • with chisel- or button-type inserts [3]
- 10/54 • • the bit being of the rotary drag type, e.g. fork-type bits [3, 2006.01]
- 10/55 • • • with preformed cutting elements (inserts *per se* E21B 10/56, E21B 10/58) [2006.01]
- 10/56 • • Button-type inserts (E21B 10/52 takes precedence) [3]
- 10/567 • • • with preformed cutting elements mounted on a distinct support, e.g. polycrystalline inserts [2006.01]
- 10/573 • • • • characterised by support details, e.g. the substrate construction or the interface between the substrate and the cutting element [2006.01]
- 10/58 • • Chisel-type inserts (E21B 10/52, E21B 10/54 take precedence) [3]
- 10/60 • characterised by conduits or nozzles for drilling fluids (for roller bits E21B 10/18; for percussion drill bits E21B 10/38) [3]
- 10/61 • • characterised by nozzle structure [2006.01]
- 10/62 • characterised by parts, e.g. cutting elements, which are detachable or adjustable (E21B 10/64 takes precedence; for roller bits E21B 10/20; for augers E21B 10/44) [3, 2006.01]
- 10/627 • • with plural detachable cutting elements [2006.01]
- 10/633 • • • independently detachable [2006.01]
- 10/64 • characterised by the whole or part thereof being insertable into or removable from the borehole without withdrawing the drilling pipe (retrievable core receivers E21B 25/02) [3]
- 10/66 • • the cutting element being movable through the drilling pipe and laterally shiftable [3]
- 11/00 Other drilling tools**
- 11/02 • Boring rams (percussion drives used in the borehole E21B 4/06; percussion drill bits E21B 10/36)
- 11/04 • Boring grabs
- 11/06 • with driven cutting chains or similarly-driven tools
- 12/00 Accessories for drilling tools [3]**
- 12/02 • Wear indicators [3]
- 12/04 • Drill bit protectors [3]
- 12/06 • Mechanical cleaning devices [3]
- Other equipment or details for drilling; Well equipment or well maintenance**
- 15/00 Supports for the drilling machine, e.g. derricks or masts [1, 7]**
- 15/02 • specially adapted for underwater drilling (E21B 15/04 takes precedence; floating drilling platforms B63B 35/44; drilling platforms on legs E02B 17/00) [3]
- 15/04 • specially adapted for directional drilling, e.g. slant hole rigs [3]
- 17/00 Drilling rods or pipes; Flexible drill strings; Kellies; Drill collars; Sucker rods; Casings; Tubings** (rod couplings in general F16D; tubes or tube couplings in general F16L)
- 17/01 • Risers (riser connectors E21B 33/038) [3]
- 17/02 • Couplings; Joints
- 17/03 • • between drilling rod or pipe and drill motor, e.g. between drilling rod and hammer [7]
- 17/04 • • between rod and bit, or between rod and rod
- 17/042 • • • threaded
- 17/043 • • • • with locking means
- 17/046 • • • with ribs, pins, or jaws, and complementary grooves or the like, e.g. bayonet catches
- 17/05 • • • Swivel joints
- 17/06 • • • Releasing-joints, e.g. safety joints
- 17/07 • • • Telescoping joints for varying drill string lengths; Shock absorbers (heave compensators in the derrick E21B 19/09; releasing-jars E21B 31/107) [3]
- 17/08 • • Casing joints
- 17/10 • Wear protectors; Centralising devices (drives used in the borehole with anchoring means E21B 4/18; guiding or centralising devices outside the borehole E21B 19/24)
- 17/12 • • Devices for placing or drawing out wear protectors
- 17/14 • Casing shoes
- 17/16 • Drill collars [3]
- 17/18 • Pipes provided with plural fluid passages (circulation of drilling fluid by means of such pipes E21B 21/12) [3]
- 17/20 • Flexible or articulated drilling pipes [3]
- 17/22 • Rods or pipes with helical structure (drill bits with helical conveying portion E21B 10/44) [3]
- 19/00 Handling rods, casings, tubes or the like outside the borehole, e.g. in the derrick; Apparatus for feeding the rods or cables** (surface drives E21B 1/02, E21B 3/02)
- 19/02 • Rod or cable suspensions (load-engaging elements for hoisting or lowering purposes in general B66C 1/00; crown blocks or pulley blocks B66D; cable guides B66D 1/36)
- 19/04 • • Hooks
- 19/06 • • Elevators, i.e. rod- or tube-gripping devices
- 19/07 • • • Slip-type elevators (slips in rotary tables E21B 19/10)
- 19/08 • Apparatus for feeding the rods or cables (E21B 19/22 takes precedence; automatic feed E21B 44/02; hoisting drums B66D); Apparatus for increasing or decreasing the pressure on the drilling tool; Apparatus for counterbalancing the weight of the rods [3, 7]
- 19/081 • • Screw-and-nut feed mechanisms [7]
- 19/083 • • Cam, rack or like feed mechanisms [7]
- 19/084 • • with flexible drawing means, e.g. cables [7]
- 19/086 • • with a fluid-actuated cylinder (E21B 19/084, E21B 19/087, E21B 19/09 take precedence) [7]
- 19/087 • • by means of a swinging arm [7]
- 19/089 • • with a spring or an additional weight [7]

E21B

- 19/09 • • specially adapted for drilling underwater formations from a floating support using heave compensators supporting the drill string (drilling-pipe telescoping joints E21B 17/07) [3]
- 19/10 • Slips; Spiders
- 19/12 • Rope clamps (rope clamps in general F16G 11/00)
- 19/14 • Racks, ramps, troughs or bins, for holding the lengths of rod singly or connected; Handling between storage place and borehole (E21B 19/20, E21B 19/22 take precedence) [3]
- 19/15 • • Racking of rods in horizontal position; Handling between horizontal and vertical position [3]
- 19/16 • Connecting or disconnecting pipe couplings or joints (E21B 19/20 takes precedence; pipe wrenches or the like B25B) [3]
- 19/18 • Connecting or disconnecting drill bit and drilling pipe [3]
- 19/20 • Combined feeding from rack and connecting, e.g. automatically [3]
- 19/22 • Handling reeled pipe or rod units, e.g. flexible drilling pipes [3]
- 19/24 • Guiding or centralising devices for drilling rods or pipes [7]
- 21/00 Methods or apparatus for flushing boreholes, e.g. by use of exhaust air from motor** (freeing objects stuck in boreholes by flushing E21B 31/03; well drilling compositions C09K 8/02) [2, 7]
- 21/01 • Arrangements for handling drilling fluids or cuttings outside the borehole, e.g. mud boxes (arrangements for treating drilling fluids E21B 21/06) [7]
- 21/015 • • Means engaging the bore entrance, e.g. hoods for collecting dust [7]
- 21/02 • Swivel joints in hose lines
- 21/06 • Arrangements for treating drilling fluids outside the borehole (treating steps per se, see the relevant subclasses) [3]
- 21/07 • • for treating dust-laden gaseous fluids [7]
- 21/08 • Controlling or monitoring pressure or flow of drilling fluid, e.g. automatic filling of boreholes, automatic control of bottom pressure (valve arrangements therefor E21B 21/10) [3]
- 21/10 • Valves arrangements in drilling-fluid circulation systems (valves in general F16K) [3]
- 21/12 • using drilling pipes with plural fluid passages, e.g. closed circulation systems (pipes with plural fluid passages E21B 17/18) [3]
- 21/14 • using liquids and gases, e.g. foams [3]
- 21/16 • using gaseous fluids (E21B 21/14 takes precedence; arrangements for handling drilling fluids outside the borehole E21B 21/01; arrangements for treating drilling fluids E21B 21/06) [7]
- 21/18 • Preventing exhaust air from the drill motor from blowing-off towards the working face [7]
- 23/00 Apparatus for displacing, setting, locking, releasing or removing tools, packers or the like in boreholes or wells** (setting of casings, screens, or liners E21B 43/10)
- 23/01 • for anchoring the tools or the like (E21B 23/02-E21B 23/06 take precedence; anchoring of drives in the borehole E21B 4/18) [6]
- 23/02 • for locking the tools or the like in landing nipples or in recesses between adjacent sections of tubing (E21B 23/03-E21B 23/06 take precedence) [3]
- 23/03 • for setting the tools into, or removing the tools from, laterally offset landing nipples or pockets [3]
- 23/04 • operated by fluid means, e.g. actuated by explosion (E21B 23/06, E21B 23/08 take precedence) [3]
- 23/06 • for setting packers
- 23/08 • Introducing or running tools by fluid pressure, e.g. through-the-flow-line tool systems (special provisions on heads therefor E21B 33/068; cementing plugs E21B 33/16; scrapers operated by fluid pressure E21B 37/04) [3]
- 23/10 • • Tools specially adapted therefor [3]
- 23/12 • • Tool diverters [3]
- 23/14 • for displacing a cable or a cable-operated tool, e.g. for logging or perforating operations in deviated wells (by fluid pressure E21B 23/08; provision on well heads for introducing or removing cable-operated tools E21B 33/072, E21B 33/076) [6]
- 25/00 Apparatus for obtaining or removing undisturbed cores, e.g. core barrels, core extractors** (core bits E21B 10/02; using explosives or projectiles in boreholes E21B 49/04; side-wall sampling or coring E21B 49/06)
- 25/02 • the core receiver being insertable into, or removable from, the borehole without withdrawing the drilling pipe (retrievable drill bits E21B 10/64) [3]
- 25/04 • • the core receiver having a core forming cutting edge or element, e.g. punch type core barrels [3]
- 25/06 • the core receiver having a flexible liner or inflatable retaining means [3]
- 25/08 • Coating, freezing, consolidating cores (E21B 25/06 takes precedence); Recovering uncontaminated cores or cores at formation pressure [3]
- 25/10 • Formed core retaining or severing means (E21B 25/06, E21B 25/08 take precedence) [3]
- 25/12 • • of the sliding wedge type [3]
- 25/14 • • mounted on pivot transverse to core axis [3]
- 25/16 • for obtaining oriented cores [3]
- 25/18 • the core receiver being specially adapted for operation under water [3]
- 27/00 Containers for collecting or depositing substances in boreholes or wells, e.g. bailers for collecting mud or sand; Drill bits with means for collecting substances, e.g. valve drill bits** [6, 2006.01]
- 27/02 • Dump bailers, i.e. containers for depositing substances, e.g. cement or acids [6, 2006.01]
- 27/04 • where the collecting or depositing means include helical conveying means [2006.01]
- 28/00 Vibration generating arrangements for boreholes or wells, e.g. for stimulating production** (for drilling E21B 7/24; for transmitting measuring-signals E21B 47/14; for geophysical measurements G01V 1/02) [6]
- 29/00 Cutting or destroying pipes, packers, plugs, or wire lines, located in boreholes or wells, e.g. cutting of damaged pipes, of windows** (perforators E21B 43/11); **Deforming of pipes in boreholes or wells; Reconditioning of well casings while in the ground**
- 29/02 • by explosives or by thermal or chemical means (destroying objects in boreholes or wells by explosives E21B 31/16)
- 29/04 • Cutting of wire lines or the like (E21B 29/02 takes precedence) [3]
- 29/06 • Cutting windows, e.g. directional window cutters for whipstock operations (E21B 29/08 takes precedence; whipstocks E21B 7/08) [3]
- 29/08 • Cutting or deforming pipes to control fluid flow (blow-out preventers E21B 33/06) [3]
- 29/10 • Reconditioning of well casings, e.g. straightening [3]
- 29/12 • specially adapted for underwater installations (E21B 29/08 takes precedence) [3]

- 31/00 Fishing for or freeing objects in boreholes or wells** (provisions on well heads for introducing or removing objects E21B 33/068; locating or determining the position of objects in boreholes or wells E21B 47/09)
- 31/03 • Freeing by flushing [3]
 - 31/06 • using magnetic means [3]
 - 31/08 • using junk baskets or the like [3]
 - 31/107 • using impact means for releasing stuck parts, e.g. jars (telescoping joints E21B 17/07) [3]
 - 31/113 • • hydraulically operated [3]
 - 31/12 • Grappling tools, e.g. tongs or grabs
 - 31/14 • • with means deflecting the direction of the tool, e.g. by use of knuckle joints (apparatus for deflecting the boring E21B 7/08) [3]
 - 31/16 • • combined with cutting or destroying means (cutting or destroying means per se E21B 29/00) [3]
 - 31/18 • • gripping externally, e.g. overshot [3]
 - 31/20 • • gripping internally, e.g. fishing spears [3]
- 33/00 Sealing or packing boreholes or wells**
- 33/02 • Surface sealing or packing
 - 33/03 • • Well heads; Setting-up thereof (valve arrangements therefor E21B 34/02)
 - 33/035 • • • specially adapted for underwater installations (E21B 33/043, E21B 33/064, E21B 33/076 take precedence) [3]
 - 33/037 • • • • Protective housings therefor [3]
 - 33/038 • • • • Connectors used on well heads, e.g. for connecting blow-out preventer and riser (connecting a production flow line to an underwater well head E21B 43/013) [3]
 - 33/04 • • • Casing heads; Suspending casings or tubings in well heads (setting of casings in wells E21B 43/10)
 - 33/043 • • • • specially adapted for underwater well heads (E21B 33/047 takes precedence) [3]
 - 33/047 • • • • for plural tubing strings [3]
 - 33/05 • • • • Cementing-heads, e.g. having provision for introducing cementing plugs
 - 33/06 • • • • Blow-out preventers [3]
 - 33/064 • • • • specially adapted for underwater well heads (connectors therefor E21B 33/038) [3]
 - 33/068 • • • • having provision for introducing objects or fluids into, or removing objects from, wells (cementing-heads E21B 33/05) [3]
 - 33/072 • • • • for cable-operated tools (E21B 33/076 takes precedence) [3]
 - 33/076 • • • • specially adapted for underwater installations [3]
 - 33/08 • • Wipers; Oil savers
 - 33/10 • in the borehole
 - 33/12 • • Packers; Plugs (used for cementing E21B 33/134, E21B 33/16)
 - 33/122 • • • Multiple-string packers
 - 33/124 • • • Units with longitudinally-spaced plugs for isolating the intermediate space
 - 33/126 • • • with fluid-pressure-operated elastic cup or skirt (E21B 33/122, E21B 33/124 take precedence)
 - 33/127 • • • with inflatable sleeve (E21B 33/122, E21B 33/124 take precedence)
 - 33/128 • • • with a member expanded radially by axial pressure (E21B 33/122, E21B 33/124 take precedence)
 - 33/129 • • • with mechanical slips for hooking into the casing (E21B 33/122, E21B 33/124 take precedence)
- 33/1295 • • • • actuated by fluid pressure [6]
- 33/13 • • Methods or devices for cementing, for plugging holes, crevices, or the like (dump bailers E21B 27/02; chemical compositions therefor C09K 8/00) [1, 2006.01]
- 33/134 • • • Bridging plugs
- 33/136 • • • Baskets, e.g. of umbrella type
- 33/138 • • • Plastering the borehole wall; Injecting into the formation
- 33/14 • • • for cementing casings into boreholes
- 33/16 • • • • using plugs for isolating cement charge; Plugs therefor
- 34/00 Valve arrangements for boreholes or wells** (in drilling fluid circulation systems E21B 21/10; blow-out preventers E21B 33/06; oil flow regulating apparatus E21B 43/12; valves in general F16K) [3]
- 34/02 • in well heads [3]
 - 34/04 • • in underwater well heads [3]
 - 34/06 • in wells [3]
 - 34/08 • • responsive to flow or pressure of the fluid obtained (E21B 34/10 takes precedence) [3]
 - 34/10 • • operated by control fluid supplied from outside the borehole (control means being outside the borehole E21B 34/16) [3]
 - 34/12 • • operated by movement of casings or tubings [3]
 - 34/14 • • operated by movement of tools, e.g. sleeve valves operated by pistons or wire line tools [3]
 - 34/16 • Control means therefor being outside the borehole [3]
- 35/00 Methods or apparatus for preventing or extinguishing fires** (cutting or deforming pipes to control fluid flow E21B 29/08; controlling flow of fluid to or in wells E21B 43/12; fire fighting in general A62C, A62D)
- 36/00 Heating, cooling, or insulating arrangements for boreholes or wells, e.g. for use in permafrost zones** (drilling by use of heat E21B 7/14; secondary recovery methods using heat E21B 43/24) [3]
- 36/02 • using burners [3]
 - 36/04 • using electrical heaters [3]
- 37/00 Methods or apparatus for cleaning boreholes or wells** (E21B 21/00 takes precedence; cleaning pipes in general B08B 9/02)
- 37/02 • Scrapers specially adapted therefor
 - 37/04 • • operated by fluid pressure, e.g. free-piston scrapers (operating other tools by fluid pressure E21B 23/08) [3]
 - 37/06 • using chemical means for preventing or limiting the deposition of paraffins or like substances (chemical compositions therefor C09K 8/52) [3, 2006.01]
 - 37/08 • cleaning in situ of down-hole filters, screens, or gravel packs (E21B 37/06 takes precedence) [3]
 - 37/10 • Well swabs [3]
- 40/00 Tubing catchers, automatically arresting the fall of oil-well tubing**
- 41/00 Equipment or details not covered by groups E21B 15/00-E21B 40/00**
- 41/02 • in situ inhibition of corrosion in boreholes or wells (dump bailers E21B 27/02; chemical compositions therefor C09K 8/54; inhibiting corrosion in general C23F) [3, 6, 2006.01]

E21B

- 41/04 • Manipulators for underwater operations, e.g. temporarily connected to well heads (manipulators in general B25J) [3]
- 41/06 • Work chambers for underwater operations, e.g. temporarily connected to well heads (in general B63C 11/00) [3]
- 41/08 • Underwater guide bases, e.g. drilling templates; Levelling thereof [7]
- 41/10 • Guide posts, e.g. releasable; Attaching guide lines to underwater guide bases [7]

Obtaining fluids from wells [3]

43/00 Methods or apparatus for obtaining oil, gas, water, soluble or meltable materials or a slurry of minerals from wells (applicable only to water E03B; obtaining oil-bearing deposits or soluble or meltable materials by mining techniques E21C 41/00; pumps F04)

- 43/01 • specially adapted for obtaining from underwater installations (underwater well heads E21B 33/035)
- 43/013 • • Connecting a production flow line to an underwater well head [3]
- 43/017 • • Production satellite stations, i.e. underwater installations comprising a plurality of satellite well heads connected to a central station (underwater separating arrangements E21B 43/36) [3]
- 43/02 • Subsoil filtering (E21B 43/11 takes precedence; chemical compositions for consolidating loose sand or the like around wells C09K 8/56) [1, 2006.01]
- 43/04 • • Graveling of wells
- 43/08 • • Screens or liners
- 43/10 • • Setting of casings, screens or liners in wells (driving or forcing casings into boreholes, simultaneously drilling and casing boreholes E21B 7/20; setting of tools, packers or the like E21B 23/00; suspending casings in well heads E21B 33/04)
- 43/11 • Perforators; Permeators
- 43/112 • • Perforators with extendable perforating members, e.g. actuated by fluid means
- 43/114 • • Perforators using direct fluid action, e.g. abrasive jets
- 43/116 • • Gun or shaped-charge perforators
- 43/117 • • • Shaped-charge perforators (E21B 43/118 takes precedence)
- 43/118 • • • characterised by lowering in vertical position and subsequent tilting to operating position
- 43/1185 • • • Ignition systems [3]
- 43/119 • • Details, e.g. for locating perforating place or direction
- 43/12 • Methods or apparatus for controlling the flow of the obtained fluid to or in wells (E21B 43/25 takes precedence; valve arrangements E21B 34/00)
- 43/14 • Obtaining from a multiple-zone well
- 43/16 • Enhanced recovery methods for obtaining hydrocarbons (fracturing E21B 43/26; obtaining slurry E21B 43/29; reclamation of contaminated soil in situ B09C)
- 43/17 • • Interconnecting two or more wells by fracturing or otherwise attacking the formation (E21B 43/247 takes precedence) [3]
- 43/18 • • Repressuring or vacuum methods
- 43/20 • • Displacing by water

- 43/22 • • Use of chemicals or bacterial activity (E21B 43/27 takes precedence; chemical or bacterial compositions therefor C09K 8/58; chemical features in extracting oils from oil sands or shales C10G) [1, 2006.01]
- 43/24 • • using heat, e.g. steam injection (heating, cooling or insulating wells E21B 36/00)
- 43/241 • • • combined with solution mining of non-hydrocarbon minerals, e.g. solvent pyrolysis of oil shale [5]
- 43/243 • • • Combustion in situ [3]
- 43/247 • • • • in association with fracturing processes [3]
- 43/248 • • • • using explosives [5]
- 43/25 • Methods for stimulating production (dump bailers E21B 27/02; vibration generating arrangements E21B 28/00; chemical compositions therefor C09K 8/60) [1, 2006.01]
- 43/26 • • by forming crevices or fractures
- 43/263 • • • using explosives [3]
- 43/267 • • • reinforcing fractures by propping [3]
- 43/27 • • • by use of eroding chemicals, e.g. acids
- 43/28 • Dissolving minerals other than hydrocarbons, e.g. by an alkaline or acid leaching agent (E21B 43/241 takes precedence) [5]
- 43/285 • Melting minerals, e.g. sulfur (E21B 43/24 takes precedence; heating, cooling or insulating arrangements for wells E21B 36/00) [5]
- 43/29 • Obtaining a slurry of minerals, e.g. by using nozzles [5]
- 43/295 • Gasification of minerals, e.g. for producing mixtures of combustible gases (E21B 43/243 takes precedence) [5]
- 43/30 • Specific pattern of wells, e.g. optimizing the spacing of wells (production satellite stations E21B 43/017) [3]
- 43/32 • Preventing gas- or water-coning phenomena, i.e. the formation of a conical column of gas or water around wells [3]
- 43/34 • Arrangements for separating materials produced by the well (separating apparatus per se, see the relevant subclasses) [3]
- 43/36 • • Underwater separating arrangements (E21B 43/38 takes precedence) [3]
- 43/38 • • in the well [3]
- 43/40 • • Separation associated with re-injection of separated materials [3]

Automatic control; Surveying or testing [3]

44/00 Automatic control systems specially adapted for drilling operations, i.e. self-operating systems which function to carry out or modify a drilling operation without intervention of a human operator, e.g. computer-controlled drilling systems (for non-automatic drilling control, see the operation controlled; automatic feeding from rack and connecting of drilling pipes E21B 19/20; controlling pressure or flow of drilling fluid E21B 21/08); **Systems specially adapted for monitoring a plurality of drilling variables or conditions** (means for transmitting measuring-signals from the well to the surface E21B 47/12) [3]

- 44/02 • Automatic control of the tool feed (E21B 44/10 takes precedence) [7]
- 44/04 • • in response to the torque of the drive [7]

- 44/06 • • in response to the flow or pressure of the motive fluid of the drive [7]
- 44/08 • • in response to the amplitude of the movement of the percussion tool, e.g. jump or recoil [7]
- 44/10 • Arrangements for automatic stopping when the tool is lifted from the working face [7]

Surveying or testing

45/00 Measuring the drilling time or rate of penetration

- 47/00 Survey of boreholes or wells** (monitoring pressure or flow of drilling fluid E21B 21/08; geophysical logging G01V)
 - 47/01 • Devices for supporting measuring instruments on a drill pipe, rod or wireline (setting or locking tools in boreholes or wells E21B 23/00); Protecting measuring instruments in boreholes against heat, shock, pressure or the like [6]
 - 47/02 • Determining slope or direction (clinometers or direction meters G01C)
 - 47/022 • • of the borehole
 - 47/024 • • of devices in the borehole (E21B 47/022 takes precedence)
 - 47/026 • • of penetrated ground layers (apparatus for obtaining oriented cores E21B 25/16; formation testing E21B 49/00)
 - 47/04 • Measuring depth or liquid level (measuring liquid level in general G01F)

- 47/06 • Measuring temperature or pressure (measuring temperature in general G01K; measuring pressure in general G01L)
- 47/08 • Measuring diameter (measuring diameter in general G01B)
- 47/09 • Locating or determining the position of objects in boreholes or wells; Identifying the free or blocked portions of pipes (measuring depth E21B 47/04; measuring diameter E21B 47/08) [3]
- 47/10 • Locating fluid leaks, intrusions, or movements
- 47/12 • Means for transmitting measuring-signals from the well to the surface, e.g. for logging while drilling (remote signalling in general G08)
 - 47/14 • • using acoustic waves [6]
 - 47/16 • • • through the drill string or casing [6]
 - 47/18 • • • through the well fluid [6]
- 49/00 Testing the nature of borehole walls; Formation testing; Methods or apparatus for obtaining samples of soil or well fluids, specially adapted to earth drilling or wells** (sampling in general G01N 1/00)
 - 49/02 • by mechanically taking samples of the soil (apparatus for obtaining undisturbed cores E21B 25/00; investigation of foundation soil *in situ* E02D 1/00)
 - 49/04 • • using explosives in boreholes; using projectiles penetrating the wall [3]
 - 49/06 • • using side-wall drilling tools or scrapers
 - 49/08 • Obtaining fluid samples or testing fluids, in boreholes or wells [3]
 - 49/10 • • using side-wall fluid samplers or testers [3]

E21C MINING OR QUARRYING

Subclass index

CUTTING; SLITTING; DISLODGING

- General structure of machines.....25/00, 27/00
- Details.....29/00, 31/00, 35/00
- Other devices.....33/00, 37/00, 39/00

METHODS OF MINING OR QUARRYING; OPEN-PIT MINING.....41/00, 45/00, 47/00, 49/00

OBTAINING MINERALS FROM UNDERWATER.....50/00

WINNING MATERIALS FROM EXTRATERRESTRIAL SOURCES.....51/00

Cutting; Slitting; Dislodging

- 25/00 Cutting machines, i.e. for making slits approximately parallel or perpendicular to the seam** (dislodging machines with slitting means E21C 27/02, E21C 27/10, E21C 27/18)
 - 25/02 • Machines slitting solely by one or more percussive tools moved through the seam
 - 25/04 • • Cutting crowns or other tools (percussion drill bits E21B 10/36)
 - 25/06 • Machines slitting solely by one or more cutting rods or cutting drums which rotate, move through the seam, and may or may not reciprocate
 - 25/08 • • Mountings for the rods or drums
 - 25/10 • • Rods; Drums [6]
 - 25/14 • • with equipment for cleaning the slit (associated with cutter chain machines E21C 25/50)
 - 25/16 • Machines slitting solely by one or more rotating saws, cutting discs, or wheels
 - 25/18 • • Saws; Discs; Wheels

- 25/20 • Machines slitting solely by one or more reciprocating sawing implements or reciprocating cutter chains; Shaker conveyers with cutting means
- 25/22 • Machines slitting solely by one or more cutter chains moving unidirectionally along jibs
 - 25/24 • • with flat jibs only
 - 25/26 • • with curved jibs only
 - 25/28 • • Chains or chain guides [6]
 - 25/30 • • • Chain guides
 - 25/32 • • • • specially adapted for curved jibs
 - 25/34 • • • • Chains
 - 25/36 • • • • Couplings for links
 - 25/40 • • • • having links with integrally formed picks
 - 25/50 • • with equipment for cleaning the slit (associated with rotary-rod or rotary-drum machines E21C 25/14)
 - 25/52 • Machines incorporating two or more of the slitting means according to groups E21C 25/02, E21C 25/06, E21C 25/16, E21C 25/20 and E21C 25/22

E21C

- 25/54 • Slitting by unguided cutter cables or cutter chains or by unguided tools drawn along the working face by cables or the like (dislodging by planing means E21C 27/32; propulsion by haulage cables E21C 29/14)
- 25/56 • Slitting by cutter cables or cutter chains or by tools drawn along the working face by cables or the like, in each case guided parallel to the face, e.g. by a conveyer, by a guide parallel to a conveyer (pressing the conveyer equipped with tools toward the working face E21C 35/14)
- 25/58 • Machines slitting by drilling hole on hole
- 25/60 • Slitting by jets of water or other liquid (picks with arrangement of fluid-spraying nozzles E21C 35/187; distribution of spraying fluids in rotating cutter-heads E21C 35/23) [6]
- 25/62 • Machines for making slits approximately perpendicular to the seams either level with, or above or below the level of, the machine
- 25/64 • Slitting machines guided solely by hand and either carried by hand or mounted on supports (hand-held power-operated tools E21C 37/22)
- 25/66 • Machines for making slits with additional arrangements for drilling
- 25/68 • Machines for making slits combined with equipment for removing, e.g. by loading, material won by other means (slitting machines combined with planing means E21C 27/18; removing chippings E21C 35/20)

- 27/00 Machines which completely free the mineral from the seam**
- 27/01 • specially adapted for removing overhanging coal
- 27/02 • solely by slitting (rods, drums, for same E21C 25/10; saws, discs, wheels E21C 25/18; chains, chain guides, for same E21C 25/28)
- 27/04 • • by a single chain guided on a frame with or without auxiliary slitting means
- 27/06 • • • with a slewing frame
- 27/08 • • with additional means for cutting the mineral into blocks
- 27/10 • by both slitting and breaking-down
- 27/12 • • breaking-down effected by acting on the vertical face of the mineral, e.g. by percussive tools
- 27/14 • • breaking-down effected by force or pressure applied to side of slit, e.g. by wedges (breaking-down by means inserted in boreholes E21C 37/00)
- 27/16 • • • with means for both slitting and breaking-down
- 27/18 • by both slitting and planing
- 27/20 • Mineral freed by means not involving slitting
- 27/22 • • by rotary drills with breaking-down means, e.g. wedge-shaped drills
- 27/24 • • by milling means acting on the full working face
- 27/26 • • by closely adjacent cutter chains acting on the full working face
- 27/28 • • by percussive drills with breaking-down means, e.g. wedge-shaped tools
- 27/30 • • by jaws, buckets, or scoops that scoop-out the mineral
- 27/32 • • by adjustable or non-adjustable planing means with or without loading arrangements (by percussed planing means E21C 27/46)
- 27/34 • • • Machine propelled along the working face by cable or chain
- 27/35 • • • Ram-ploughs
- 27/36 • • • Machine self-propelled along the working face
- 27/38 • • • Machine stationary while planing in an arc

- 27/40 • • • Machine and its planing tool making alternative step-wise movements along the working face
- 27/42 • • • combined with scraper or collector box
- 27/44 • • • Planing knives (mining picks E21C 35/18)
- 27/46 • • by percussed planing means

- 29/00 Propulsion of machines for slitting or completely freeing the mineral from the seam**
- 29/02 • by means on the machine exerting a thrust against fixed supports
- 29/04 • by cable or chains
- 29/06 • • anchored at one or both ends to the mine working face
- 29/08 • • • Anchoring arrangements (for anchoring of conveyers only E21F 13/00)
- 29/10 • • • Cable or chain co-operating with a winch or the like on the machine
- 29/12 • • • Machines propelled by thrust or pull against a part alternately anchored to, and released from, a cable or chain
- 29/14 • • by haulage cable or chain pulling the machine along the working face
- 29/16 • • • Winches or other means for pulling cable or chain (winches in general B66D)
- 29/18 • • • Coupling and uncoupling machine to cable or chain
- 29/20 • • with safety devices operating in the event of breakage of the cable or chain
- 29/22 • by wheels, endless tracks, or the like
- 29/24 • • Trucks carrying the machine while working
- 29/26 • • • with means for adjustably positioning the machine on the truck
- 29/28 • • • • adjusting the height of the whole machine

- 31/00 Driving means incorporated in machines for slitting or completely freeing the mineral from the seam**
- 31/02 • for cutting or breaking-down devices
- 31/04 • • imparting both a rotary and reciprocating motion
- 31/06 • • actuated by an endless cable or chain
- 31/08 • for adjusting parts of the machines
- 31/10 • for slewing parts of the machines
- 31/12 • Component parts

- 33/00 Trucks or other devices for transporting machines for slitting or completely freeing the mineral from the seam**
- 33/02 • with equipment for loading or unloading the machine on to, or from, the truck

- 35/00 Details of, or accessories for, machines for slitting or completely freeing the mineral from the seam, not provided for in groups E21C 25/00-E21C 33/00, E21C 37/00 or E21C 39/00**
- 35/02 • Locking equipment for slewable parts
- 35/04 • Safety devices (operating in the event of breakage of a haulage cable or chain E21C 29/20)
- 35/06 • Equipment for positioning the whole machine in relation to its sub-structure
- 35/08 • Guiding the machine
- 35/10 • • by feelers contacting the working face
- 35/12 • • along a conveyer for the cut material
- 35/14 • • • Equipment for pressing the conveyer towards the working face
- 35/16 • • by making use of the timbering, filling, or other supports
- 35/18 • Mining picks; Holders therefor (planing knives E21C 27/44) [6]

- 35/183 • • with inserts or layers of wear-resisting material [6]
- 35/187 • • with arrangement of fluid-spraying nozzles (supply of fluid to the nozzles E21C 35/22) [6]
- 35/19 • • Means for fixing picks or holders [6]
- 35/193 • • • using bolts as main fixing elements [6]
- 35/197 • • • using sleeves, rings or the like, as main fixing elements [6]
- 35/20 • General features of equipment for removal of chippings, e.g. for loading on conveyer
- 35/22 • Equipment for preventing the formation of, or for removal of, dust (picks with arrangement of fluid-spraying nozzles E21C 35/187; methods or apparatus for flushing boreholes E21B 21/00)
- 35/23 • • Distribution of spraying-fluids in rotating cutter-heads [6]
- 35/24 • Remote control specially adapted for machines for slitting or completely freeing the mineral (control in general G05)
- 37/00 Other methods or devices for dislodging with or without loading** (breaking-down by means inserted in slits E21C 27/14)
 - 37/02 • by wedges
 - 37/04 • by devices with parts pressed mechanically against the wall of a borehole
 - 37/06 • by making use of hydraulic or pneumatic pressure in a borehole
 - 37/08 • • Devices with pistons, plungers, or the like pressed locally against the wall of the borehole
 - 37/10 • • Devices with expanding elastic casings
 - 37/12 • • by injecting into the borehole a liquid, either initially at high pressure or subsequently subjected to high pressure, e.g. by pulses, by explosive cartridges acting on the liquid (slitting by jets of water E21C 25/60; blasting by explosives F42D)
 - 37/14 • • by compressed air; by gas blast; by gasifying liquids
 - 37/16 • by fire-setting or by similar methods based on a heat effect (drilling by use of heat E21B 7/14)
 - 37/18 • by electricity
 - 37/20 • by ultrasonics
 - 37/22 • Hand tools or hand-held power-operated tools specially adapted for dislodging minerals (slitting machines guided solely by hand E21C 25/64)
 - 37/24 • • Pick hammers (pneumatic hammers in general B25D; percussion drilling E21B 1/00)
 - 37/26 • Chisels or other cutting tools not mentioned before
- 39/00 Devices for testing in situ the hardness or other properties of minerals, e.g. for giving information as to the selection of suitable mining tools**

Methods of mining or quarrying; Open-pit mining; Layouts therefor

- 41/00 Methods of underground or surface mining** (E21C 45/00 takes precedence); **Layouts therefor** (for peat E21C 49/00) [5]

- 41/16 • Methods of underground mining (winning machines therefor E21C 25/00-E21C 39/00); Layouts therefor [5]
- 41/18 • • for brown or hard coal [5]
- 41/20 • • for rock salt or potash salt [5]
- 41/22 • • for ores, e.g. mining placers [5]
- 41/24 • • for oil-bearing deposits [5]
- 41/26 • Methods of surface mining (machines for obtaining, or the removal of, materials in open-pit mines E21C 47/00); Layouts therefor [5]
- 41/28 • • for brown or hard coal [5]
- 41/30 • • for ores, e.g. mining placers [5]
- 41/32 • Reclamation of surface-mined areas (machines or methods for treating or working soil for agricultural purposes A01B 77/00, A01B 79/00; machines for back-filling E02F 5/22) [5]

45/00 Methods of hydraulic mining; Hydraulic monitors (E21C 25/60 takes precedence) [5]

- 45/02 • Means for generating pulsating fluid jets [5]
- 45/04 • • by use of highly pressurised liquid [5]
- 45/06 • • by use of compressed gases [5]
- 45/08 • Automatic or remote control of hydraulic monitors [5]

47/00 Machines for obtaining, or the removal of, materials in open-pit mines (obtaining peat E21C 49/00)

- 47/02 • for coal, brown coal, or the like (dredgers or soil-shifting machines in general E02F) [3]
- 47/04 • • Conveyer bridges used in co-operation with the winning apparatus [3]
- 47/06 • • Cableway conveyers used in co-operation with the winning apparatus (underground hauling E21F 13/00)
- 47/08 • • Devices for cutting-out partings, e.g. layers of sand between seams of coal
- 47/10 • for quarrying stone, sand, gravel, or clay

49/00 Obtaining peat; Machines therefor (treating peat C10F)

- 49/02 • by excavating
- 49/04 • by digging in the form of peat sods

50/00 Obtaining minerals from underwater, not otherwise provided for (suction dredgers or component parts thereof E02F 3/88; equipment for conveying or separating excavated material E02F 7/00; dippers G01N 1/12) [5]

- 50/02 • dependent on the ship movements (vessels or floating structures adapted for special purposes B63B 35/00) [5]

51/00 Apparatus for, or methods of, winning materials from extraterrestrial sources (cosmonautics B64G) [2]

E21C

E21D SHAFTS; TUNNELS; GALLERIES; LARGE UNDERGROUND CHAMBERS (soil-conditioning or soil-stabilising materials C09K 17/00; cutting machines for mining or quarrying E21C; safety devices, transport, rescue, ventilation or drainage E21F) [2, 6]

Note(s)

1. This subclass covers methods or apparatus for making or lining tunnels, galleries or large underground chambers, using underground mining methods only, i.e. not involving disturbance of the ground surface.
2. This subclass does not cover underground spaces made by foundation engineering, i.e. involving disturbance of the ground surface, which are covered by subclass E02D.

Subclass index

MAKING SHAFTS; LININGS THEREFOR.....	1/00, 3/00, 7/00, 8/00, 5/00
MAKING TUNNELS OR GALLERIES; LININGS THEREFOR.....	9/00, 11/00
MAKING UNDERGROUND CHAMBERS; LININGS THEREFOR.....	13/00, 11/00
WORKING-FACE SUPPORTS OR COVERS.....	15/00, 17/00, 19/00, 21/00
SUPPORTS FOR STEP-BY-STEP MOVEMENT.....	23/00
SETTING ANCHORING BOLTS.....	20/00

Shafts

- 1/00 Sinking shafts**
- 1/02 • by hand
 - 1/03 • mechanically (E21D 1/08 takes precedence)
 - 1/04 • • with grabs
 - 1/06 • • with shaft-boring cutters (drilling machines E21B)
 - 1/08 • while moving the lining downwards
 - 1/10 • Preparation of the ground
 - 1/12 • • by freezing
 - 1/14 • • • Freezing apparatus
 - 1/16 • • by petrification (grouting anchoring-bolts E21D 20/02)
- 3/00 Raising shafts, i.e. working upwards from the bottom**
- 5/00 Lining shafts; Linings therefor** (E21D 11/00 takes precedence) [3]
- 5/01 • using prefabricated lining lowered into a hole filled with liquid or viscous mass
 - 5/012 • Use of fluid-tight or anti-friction material on outside of, or between, lining layers
 - 5/016 • Bearer curbs
 - 5/02 • with wood (E21D 5/01, E21D 5/012, E21D 5/016 take precedence)
 - 5/04 • with brick, concrete, stone, or similar building materials (E21D 5/01, E21D 5/012, E21D 5/016 take precedence)
 - 5/06 • with iron or steel (E21D 5/01, E21D 5/012, E21D 5/016 take precedence)
 - 5/08 • • in the form of profiled parts
 - 5/10 • • in the form of tubing
 - 5/11 • with combinations of different materials, e.g. wood, metal, concrete (E21D 5/01, E21D 5/012, E21D 5/016 take precedence)
 - 5/12 • Accessories for making shaft linings, e.g. suspended cradles, shutterings
- 7/00 Shaft equipment, e.g. timbering within the shaft**
- 7/02 • Arrangement of guides for cages in shafts; Connection of guides for cages to shaft walls (guideways or guides for elevators B66B 7/02)
- 8/00 Shafts not provided for in groups E21D 1/00-E21D 7/00 [2006.01]**

Tunnels; Galleries; Large underground chambers; Linings therefor [3, 6]

- 9/00 Tunnels or galleries, with or without linings; Methods or apparatus for making thereof** (linings per se E21D 11/00; galleries protecting against falling rocks or avalanches E01F 7/04); **Layout of tunnels or galleries [3]**
- 9/01 • Methods or apparatus for enlarging or restoring the cross-section of tunnels, e.g. by restoring the floor to its original level [7]
 - 9/02 • Driving inclined tunnels or galleries [3]
 - 9/04 • Driving tunnels or galleries through loose materials; Apparatus therefor not otherwise provided for
 - 9/06 • Making by using a driving shield [2]
 - 9/08 • • with additional boring or cutting means [2]
 - 9/087 • • • with a rotary drilling-head cutting simultaneously the whole cross-section, i.e. full-face machines [7]
 - 9/093 • • Control of the driving shield [7]
 - 9/10 • Making by using boring or cutting machines (E21D 9/08 takes precedence; similar machines for mining E21C 27/20; mining picks E21C 35/18) [3]
 - 9/11 • • with a rotary drilling-head cutting simultaneously the whole cross-section, i.e. full-face machines [7]
 - 9/12 • Devices for removing or hauling away excavated material or spoil; Working or loading platforms (underground transport E21F 13/00) [2]
 - 9/13 • • using hydraulic or pneumatic conveying means [7]
 - 9/14 • Layout of tunnels or galleries; Constructional features of tunnels or galleries, not otherwise provided for, e.g. portals, day-light attenuation at tunnel openings [3]
- 11/00 Lining tunnels, galleries or other underground cavities, e.g. large underground chambers; Linings therefor; Making such linings in situ, e.g. by assembling** (E21D 15/00-E21D 23/00 take precedence; specially for shafts E21D 5/00; lining pressure water galleries, linings therefor E02B 9/06) [2]
- 11/02 • Lining predominantly with wood [2]
 - 11/03 • • using timber-setting machines
 - 11/04 • Lining with building materials (E21D 11/02, E21D 11/14 take precedence) [2]
 - 11/05 • • using compressible insertions

11/06	• • with bricks	15/22	• • • with member, pin, cross-piece, or the like ruptured, sheared through, or permanently deformed upon excessive pressure
11/07	• • • using brick-laying machines	15/24	• • • with axial screw-and-nut, rack-and-worm, or like mechanism
11/08	• • with preformed concrete slabs	15/26	• • • • with screw, worm, or the like not self-locking but normally prevented from rotation by friction members which slip upon excessive pressure
11/10	• • with concrete cast <i>in situ</i> ; Shuttering or other equipment adapted therefor	15/28	• • with parts held relatively to each other by friction or gripping, e.g. using wedges
11/12	• • Temporary supports for use during building; Accessories	15/30	• • • by means expanded or contracted by pressure applied through the medium of a fluid or quasi-fluid, e.g. rubber
11/14	• Lining predominantly with metal [2]	15/32	• • • by a deformable collar
11/15	• • Plate linings; Laggings, i.e. linings designed for holding back formation material or for transmitting the load to main supporting members (insulation E21D 11/38) [2]	15/34	• • • by axially-moving balls, rollers, or the like
11/18	• • Arch members	15/36	• • • by a tiltable collar surrounding one or both parts
11/20	• • • Special cross-sections, e.g. corrugated	15/38	• • • with longitudinally-divided upper or lower prop parts, e.g. interfitting laminations
11/22	• • • Clamps or other yieldable means for interconnecting adjacent arch members either rigidly, or allowing arch member parts to slide when subjected to excessive pressure	15/40	• • • Collar or other support gripped to one or both parts by toggle-action, cam, or other member pivoted or similarly mounted
11/24	• • • Knuckle joints or links between arch members	15/42	• • • with special parts to influence the friction
11/26	• • • Shoes for connecting arch members to longitudinal struts	15/43	• • • Details of wedges (friction linings or pads E21D 15/42)
11/28	• • Longitudinal struts	15/44	• • Hydraulic, pneumatic, or hydraulic-pneumatic props
11/30	• • Bases for lower arch members (for props E21D 15/54)	15/45	• • • having closed fluid system, e.g. with built-in pumps or accumulators
11/34	• • Joints between vertical props and horizontal top bars (end caps forming part of the props E21D 15/54)	15/46	• • with load-measuring devices; with alarm devices
11/36	• • Linings or supports specially shaped for tunnels or galleries of irregular cross-section [2, 3]	15/48	• Chocks or the like
11/38	• Waterproofing (in general E02D 31/00); Heat insulating; Soundproofing; Electric insulating (for building constructions in general E04B 1/62) [2]	15/50	• Component parts or details of props (E21D 15/43, E21D 15/58, E21D 15/60 take precedence)
11/40	• Devices or apparatus specially adapted for handling or placing units of linings for tunnels or galleries [2]	15/502	• • Prop bodies characterised by their shape, e.g. of specified cross-section
13/00	Large underground chambers; Methods or apparatus for making them (lining E21D 11/00) [6]	15/51	• • specially adapted to hydraulic, pneumatic, or hydraulic-pneumatic props, e.g. arrangements of relief valves
13/02	• Methods	15/52	• • Extensible units located above or below standard props
13/04	• Special equipment; Accessories	15/54	• • Details of the ends of props (for permitting step-by-step movement E21D 23/06)
Working-face supports		15/55	• • • of prop heads
15/00	Props (in the building art E04G 25/00); Chocks	15/56	• • Details of locks of telescopic props
15/02	• Non-telescopic props	15/58	• Devices for setting props
15/04	• • with wooden prop parts joined by double conical connectors	15/582	• • for mechanical props
15/06	• • with parts joined by a lock, with or without slight axial adjustability	15/59	• • for hydraulic, pneumatic, or hydraulic-pneumatic props
15/08	• • • with toggle joint connection	15/60	• Devices for withdrawing props or chocks
15/10	• • • with dog-clutch or pin-and-hole connection	17/00	Caps for supporting mine roofs
15/12	• • • with locking devices located near head or foot	17/01	• characterised by the shape of the cap, e.g. of specified cross-section
15/14	• Telescopic props (general means for fixing telescopic parts together F16B)	17/02	• Cantilever extension or similar protecting devices
15/15	• • Means counteracting entry of dirt; Built-in cleaning devices	17/022	• • Auxiliary devices for temporary support of roof-supporting beams whilst assembling
15/16	• • with parts held together by positive means, with or without relative sliding movement when the prop is subject to excessive pressure	17/03	• • Brackets for roof-supporting bars
15/18	• • • with one part resting on a supporting medium, e.g. rubber, sand, bitumen, lead, located in the other part, with or without expulsion or displacement of the medium upon excessive pressure	17/04	• • for use in longwall working
15/20	• • • with pawl, pin, cross-piece, or the like engaging with ratchet teeth, notches, holes, or the like spaced apart at intervals	17/05	• • • hydraulically extensible
		17/054	• • • hydraulically pivotable
		17/06	• • for use in drifting galleries
		17/08	• • Cap joints for obtaining a coal-face free of pit-props
		17/082	• • • of sliding type
		17/086	• • • of articulated type

E21D

- 17/10 • Details of mine caps for engaging the tops of pit-props, with or without retaining-plates; Retaining-plates
- 19/00 Provisional protective covers for working space** (E21D 9/06, E21D 23/00 take precedence) [3]
- 19/02 • for use in longwall working
- 19/04 • for use in drifting galleries
- 19/06 • Arrangements for applying the covers [6]
- 20/00 Setting anchoring-bolts** (anchoring bolts for shafts, tunnels or galleries E21D 21/00; means for anchoring structural elements or bulkheads specially adapted to foundation engineering E02D 5/74; dowels or other devices fastened in walls or the like by inserting them in holes made therein for that purpose F16B 13/00) [5]
- 20/02 • with provisions for grouting
- 21/00 Anchoring-bolts for roof, floor, or shaft-lining protection** (dowels or other devices fastened in walls or the like by inserting them in holes made therein for that purpose F16B 13/00) [5]
- 21/02 • having means for indicating tension (screwed connections specially modified for indicating tensile load F16B 31/02)
- 23/00 Mine roof supports for step-by-step movement, e.g. in combination with provisions for shifting of conveyers, mining machines, or guides therefor** (shifting of mine conveyers at the working face, per se E21F 13/08)
- 23/03 • having protective means, e.g. shields, for preventing or impeding entry of loose material into the working space or support [4]
- 23/04 • Structural features of the supporting construction, e.g. linking members between adjacent frames or sets of props; Means for counteracting lateral sliding on inclined floor (E21D 23/14 takes precedence)
- 23/06 • • Special mine caps or special tops of pit-props for permitting step-by-step movement
- 23/08 • Advancing mechanisms (E21D 23/16 takes precedence)
- 23/10 • • with advancing devices separate from the supporting construction
- 23/12 • Control, e.g. using remote control (E21D 23/16 takes precedence)
- 23/14 • • Effecting automatic sequential movement of supports, e.g. one behind the other
- 23/16 • Hydraulic or pneumatic features, e.g. circuits, arrangement or adaptation of valves, setting or retracting devices
- 23/18 • • of advancing mechanisms
- 23/20 • • • for sequential movement, e.g. one behind the other
- 23/22 • • • incorporated in mine caps
- 23/24 • • • the advancing mechanisms being separate from the supporting construction
- 23/26 • • Hydraulic or pneumatic control
- E21F SAFETY DEVICES, TRANSPORT, FILLING-UP, RESCUE, VENTILATION, OR DRAINAGE IN OR OF MINES OR TUNNELS [2]**

Subclass index

VENTILATION.....	1/00, 3/00
DRAINAGE.....	16/00
SAFETY DEVICES, RESCUE DEVICES.....	5/00-11/00
TRANSPORT; FILLING-UP.....	13/00, 15/00
OTHER METHODS OR DEVICES.....	17/00

Ventilation of mines or tunnels

- 1/00 Ventilation of mines or tunnels; Distribution of ventilating currents** (ventilating rooms or spaces in general F24F) [2]
- 1/02 • Test models (analogue computers therefor G06G 7/50)
- 1/04 • Air ducts (suspension devices E21F 17/02)
- 1/06 • • Duct connections (tube connections in general F16L)
- 1/08 • Ventilation arrangements in connection with air ducts, e.g. arrangements for mounting ventilators (ventilators per se F04D)
- 1/10 • Air doors (doors in general E06B)
- 1/12 • • Devices for automatically opening air doors
- 1/14 • Air partitions; Air locks (dams E21F 17/103; air locks for foundations E02D) [6]
- 1/16 • Shaft covers
- 1/18 • Gravity-flow ventilation (E21F 1/02-E21F 1/16 take precedence) [2]

- 3/00 Cooling or drying of air** (air-conditioning rooms or spaces in general F24F)

Safety devices; Rescue devices

- 5/00 Means or methods for preventing, binding, depositing or removing dust; Preventing explosions or fires** (dams E21F 17/103; applying liquids or other fluent materials to surfaces in general B05; flue-gas indicators G01N) [6]
- 5/02 • by wetting or spraying
- 5/04 • • Spraying barriers (spray nipples, spraying in general B05B, B05D; picks with arrangement of fluid-spraying nozzles E21C 35/187)
- 5/06 • • Fluids used for spraying
- 5/08 • Rock dusting; Depositing other protective substances
- 5/10 • • Devices for rock dusting
- 5/12 • • Composition of rock dust
- 5/14 • Fluid barriers or rock dusters made to work by, or at the same time as, shots or explosions

5/16	• Layers of hygroscopic or other salts deposited on floors, walls, or the like, for binding dust; Deposition of such layers (dust-absorbing materials in general C09K 3/22)	15/02	• Supporting means, e.g. shuttering, for filling-up materials
5/18	• Impregnating walls, or the like, with liquids for binding dust	15/04	• • Stowing mats; Goaf wire netting; Partition walls
5/20	• Drawing-off or depositing dust (methods or apparatus for flushing boreholes E21B 21/00; while slitting E21C 35/22) [1, 7]	15/06	• Filling-up mechanically
		15/08	• Filling-up hydraulically or pneumatically (hydraulic or pneumatic transport devices B65G; pipes, pipe couplings F16L)
		15/10	• • Hydraulic or pneumatic filling-up machines
7/00	Methods or devices for drawing-off gases with or without subsequent use of the gas for any purpose	16/00	Drainage (keeping dry foundation sites or other areas in the ground E02D 19/00) [2]
9/00	Devices preventing sparking of machines or apparatus (preventing sparking of electric machines or apparatus H01K, H02K)	16/02	• of tunnels [2]
11/00	Rescue devices or other safety devices, e.g. safety chambers, escape ways (breathing aids for curative purposes A61H 31/00; respiratory apparatus A62B 7/00; revival apparatus A62B 33/00)	17/00	Methods or devices for use in mines or tunnels, not covered elsewhere (mine lighting F21, H05B) [2]
13/00	Transport specially adapted to underground conditions (mine cars B61D; transport in general, loading B65G)	17/02	• Suspension devices for tubes or the like, e.g. for ventilating ducts (supporting pipes, cables or protective tubing in general F16L 3/00-F16L 7/00)
13/02	• in galleries	17/04	• Distributing means for power supply [2]
13/04	• in gravity inclines; in staple or inclined shafts	17/06	• • Distributing electric power; Cable networks; Conduits for cables (circuit arrangements for supplying or distributing electric power in general H02J)
13/06	• at or adjacent to the working face	17/08	• • Distributing hydraulic power; Pipe networks for hydraulic liquid (pipe-line systems in general F17D)
13/08	• Shifting conveyers or other transport devices from one location at the working face to another (guiding mining machines along conveyers for the cut mineral E21C 35/12; in combination with mine roof supports for step-by-step movement E21D 23/00)	17/10	• • Distributing pneumatic power; Pipe networks for compressed air (pipe-line systems in general F17D)
13/10	• Anchorings for conveyers [2]	17/103	• Dams, e.g. for ventilation [6]
		17/107	• • inflatable [6]
		17/12	• • Dam doors
		17/16	• Modification of mine passages or chambers for storage purposes, especially for liquids or gases (storing fluids in natural or artificial cavities or chambers in the earth B65G 5/00)
15/00	Methods or devices for placing filling-up materials in underground workings (dams E21F 17/103) [6]	17/18	• Special adaptations of signalling or alarm devices (for elevators, escalators or moving walkways B66B; gas-sensitive devices <u>per se</u> G01N)

E99 SUBJECT MATTER NOT OTHERWISE PROVIDED FOR IN THIS SECTION

E99Z SUBJECT MATTER NOT OTHERWISE PROVIDED FOR IN THIS SECTION [2006.01]

Note(s) [2006.01]

This subclass covers subject matter that:

- a. is not provided for, but is most closely related to, the subject matter covered by the subclasses of this section, and
- b. is not explicitly covered by any subclass of another section.

99/00 Subject matter not otherwise provided for in this section [2006.01]