

# CPC COOPERATIVE PATENT CLASSIFICATION

## F MECHANICAL ENGINEERING; LIGHTING; HEATING; WEAPONS; BLASTING (NOTE omitted)

### ENGINEERING IN GENERAL

## F16 ENGINEERING ELEMENTS AND UNITS; GENERAL MEASURES FOR PRODUCING AND MAINTAINING EFFECTIVE FUNCTIONING OF MACHINES OR INSTALLATIONS; THERMAL INSULATION IN GENERAL

## F16B DEVICES FOR FASTENING OR SECURING CONSTRUCTIONAL ELEMENTS OR MACHINE PARTS TOGETHER, e.g. NAILS, BOLTS, CIRCLIPS, CLAMPS, CLIPS, WEDGES, JOINTS OR JOINTING (couplings for transmitting rotation F16D)

### NOTES

1. Attention is drawn to:
  - a. the Note following group [E04B 1/38](#);
  - b. the following places:
 

<a href="#">A44B</a> <a href="#">A47G 3/00</a> <a href="#">B42F 3/00</a> <a href="#">{C14B 17/08}</a>  <a href="#">E01B 9/10</a> <a href="#">E01B 11/00</a> <a href="#">E04</a> <a href="#">E04D 13/08</a> <a href="#">E04G 5/04</a> <a href="#">E04G 7/00</a> <a href="#">E05C</a> <a href="#">F16C 29/10</a> <a href="#">F16G 17/00</a> <a href="#">F16L</a> <a href="#">F16L 3/00</a>  <a href="#">F16L 33/02</a> <a href="#">H01F 7/00</a> <a href="#">H02N 13/00</a>	Buckles, slide fasteners Ornamental heads for nails, screws, or the like Means, not using staples, for attaching sheets temporarily together {Fastening devices, e.g. clips for leather-stretching used in apparatus or machines for manufacturing or treating skins, hides, leathers or furs} Screws or bolts for railway sleepers Rail joints Connections for building Clamping means for down pipes for roof drainage Fastening scaffolds against buildings Scaffolding couplings Bolts for fasteners for wings, specially for doors or windows Locking bearings for parts moving only linearly Hooks as integral parts of chains Pipe joints Supports for pipes, cables or protective tubing, e.g. hangers, holders, clamps, cleats, clips, brackets Clips for connecting hoses to rigid members Magnetic holding devices Electrostatic holding devices.
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2. Groups [F16B 2/00](#) - [F16B 47/00](#) take precedence over group [F16B 1/00](#).
3. {In this main group, it is desirable to add the indexing codes of [F16B 2200/00](#)}

### WARNINGS

1. The following IPC groups are not in the CPC scheme. The subject matter for these IPC groups is classified in the following CPC groups:
 

<a href="#">F16B 7/08</a> <a href="#">F16B 7/12</a> <a href="#">F16B 13/13</a> <a href="#">F16B 25/02</a> <a href="#">F16B 25/04</a> <a href="#">F16B 25/06</a> <a href="#">F16B 25/08</a> <a href="#">F16B 37/10</a>	covered by covered by covered by covered by covered by covered by covered by	<a href="#">F16B 5/12</a> , <a href="#">F16B 7/04</a> , <a href="#">F16L 3/00</a> <a href="#">F16B 7/105</a> <a href="#">F16B 13/002</a> , <a href="#">F16B 13/12</a> <a href="#">F16B 25/103</a> <a href="#">F16B 25/00</a> , <a href="#">F16B 25/106</a> <a href="#">F16B 25/00</a> , <a href="#">F16B 25/106</a> <a href="#">F16B 25/00</a> , <a href="#">F16B 25/106</a> <a href="#">F16B 37/0842</a> , <a href="#">F16B 37/0871</a>
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2. {In this subclass non-limiting references (in the sense of paragraph 39 of the Guide to the IPC) may still be displayed in the scheme.}

**1/00**      **Devices for securing together, or preventing relative movement between, constructional elements or machine parts**

[2001/0007](#)      . {Fasteners made by sintering powders}

[1/0014](#)      . {by the use of a shape-memory material}

[2001/0021](#)      . {Friction-reducing coatings}

[2001/0028](#)      . {by the use of a material of the hooks-and-loops type}

- 2001/0035 . {by the use of a magnetic material}
- 2001/0042 . {by the use of an explosive charge ([F16B 19/125](#), [F16B 31/005](#) take precedence)}
- 1/005 . {by the use of a hydraulic action}
- 1/0057 . {by the use of a pneumatic action}
- 2001/0064 . {and establishing a good electrical connection}
- 1/0071 . {with markings, colours, indicators or the like (for indicating tensile load [F16B 31/02](#))}
- 2001/0078 . {having differing thermal expansion coefficients}
- 2001/0085 . {Ceramic-to-metal-connections}
- 2001/0092 . {with means for avoiding incorrect assembly or positioning}
- 1/02 . Means for securing elements of mechanisms after operation (means for bringing members to rest [F16D](#))
- 1/04 . . disengaged by movement of the actuating member of the element (locking of actuators [G05G](#), e.g. [G05G 5/00](#))

**Fastenings for constructional elements or machine parts in general** (couplings for transmitting rotation [F16D](#))

- 2/00 Friction-grip releasable fastenings** (for cables or ropes, e.g. cleats [F16G 11/00](#)) {(connections of rods or tubes, e.g. of non-circular section, mutually, including resilient connections [F16B 7/00](#))}
- 2/005 . {Means to increase the friction-coefficient}
- 2/02 . Clamps, i.e. with gripping action effected by positive means other than the inherent resistance to deformation of the material of the fastening
- 2/04 . . internal, i.e. with spreading action ([F16B 2/14](#) - [F16B 2/18](#) take precedence)
- 2/06 . . external, i.e. with contracting action ([F16B 2/14](#) - [F16B 2/18](#) take precedence)
- 2/065 . . . {using screw-thread elements ([F16B 2/08](#) - [F16B 2/12](#) take precedence)}
- 2/08 . . . using bands
- 2/10 . . . using pivoting jaws
- 2/12 . . . using sliding jaws
- 2/14 . . using wedges
- 2/16 . . using rollers or balls {(clamps for rods or tubes telescopically engaged [F16B 7/1409](#); used in anti-theft monitors, e.g. as used for articles of clothing in shops [E05B 73/0017](#))}
- 2/18 . . using cams, levers, eccentrics, or toggles {(for connections of rods or tubes engaged telescopically [F16B 7/1418](#), [F16B 7/1427](#), [F16B 7/1454](#))}
- 2/185 . . . {using levers}
- 2/20 . Clips, i.e. with gripping action effected solely by the inherent resistance to deformation of the material of the fastening
- 2/205 . . {with two stable positions}
- 2/22 . . of resilient material, e.g. rubbery material {([F16B 2/205](#) takes precedence)}
- 2/24 . . . of metal
- 2/241 . . . . {of sheet metal}
- 2/243 . . . . . {internal, i.e. with spreading action}
- 2/245 . . . . . {external, i.e. with contracting action}

- 2/246 . . . . . {the clip being released by tilting the clip or a part thereof to a position in which the axis of the openings surrounding the gripped elements is parallel to, or coincides with, the axis of the gripped elements}
- 2/248 . . . . . {of wire}
- 2/26 . . of pliable, non-resilient material, e.g. plant tie
- 3/00 Key-type connections; Keys** ([F16B 2/00](#) takes precedence; for rods or tubes mutually [F16B 7/00](#))
- 3/005 . {the key being formed by solidification of injected material (joining of preformed parts by applying molten plastics [B29C 65/40](#); non-disconnectible pipe joints obtained using a hardenable filler [F16L 13/11](#))}
- 3/04 . using keys formed of wire or other flexible material, to be inserted through an opening giving access to grooves in the adjacent surfaces of the parts to be connected
- 3/06 . using taper sleeves
- 4/00 Shrinkage connections, e.g. assembled with the parts at different temperature; Force fits** (restricted to metal parts or objects [B23P 11/02](#); **Non-releasable friction-grip fastenings** ([F16B 2/00](#) takes precedence; {using members with a shape-memory material [F16B 1/0014](#)})
- 4/002 . {engaging or disengaging by means of fluid pressure}
- 4/004 . {Press fits, force fits, interference fits, i.e. fits without heat or chemical treatment ([F16B 4/002](#) takes precedence)}
- 4/006 . {Shrinkage connections, e.g. assembled with the parts being at different temperature}
- 4/008 . . {using heat-recoverable, i.e. shrinkable, sleeves}
- 5/00 Joining sheets or plates {, e.g. panels,} to one another or to strips or bars parallel to them** (([F16B 17/00](#) takes precedence;) by sticking together [F16B 11/00](#); dowel connections [F16B 13/00](#); pins, including deformable elements [F16B 19/00](#); covering of walls [E04F 13/00](#); fastening signs, plates, panels or boards to a supporting structure, fastening readily-detachable elements, e.g. letters to signs, plates, panels, or boards, [G09F 7/00](#))
- 5/0004 . {Joining sheets, plates or panels in abutting relationship ([F16B 5/01](#) takes precedence)}
- 5/0008 . . {by moving the sheets, plates or panels substantially in their own plane, perpendicular to the abutting edge}
- 5/0012 . . . {a tongue on the edge of one sheet, plate or panel co-operating with a groove in the edge of another sheet, plate or panel}
- 5/0016 . . . . {with snap action}
- 5/002 . . . {both sheets, plates or panels having a groove, e.g. with strip-type connector}
- 5/0024 . . . {the sheets, plates or panels having holes, e.g. for dowel-type connections}
- 5/0028 . . . {using I-shaped connectors (with flanges moving towards each other [F16B 5/0068](#))}
- 5/0032 . . {by moving the sheets, plates, or panels or the interlocking key parallel to the abutting edge}
- 5/0036 . . . {and using hook and slot or keyhole-type connections}
- 5/004 . . . {and using C-shaped clamps}

- 5/0044 . . . {and using interlocking keys of circular, square, rectangular or like shape}
- 5/0048 . . . . {hinge-like}
- 5/0052 . . . {the interlocking key acting as a dovetail-type key}
- 5/0056 . . {by moving the sheets, plates or panels or the interlocking key perpendicular to the main plane}
- 5/006 . . . {and using ring-shaped clamps}
- 5/0064 . . . {and using C-shaped clamps}
- 5/0068 . . . {and using I-shaped clamps with flanges moving towards each other}
- 5/0072 . . . . {and using screw-thread}
- 5/0076 . . . {and using expanding clamps}
- 5/008 . . {by a rotating or sliding and rotating movement}
- 5/0084 . . {characterised by particular locking means}
- 5/0088 . . . {with locking means moving substantially perpendicular to the main plane, e.g. pins, screws}
- 5/0092 . . . {with locking means rotating about an axis parallel to the main plane and perpendicular to the abutting edge, e.g. screw, bayonet}
- 5/0096 . {by using permanent deformation}
- 5/01 . by means of fastening elements specially adapted for honeycomb panels
- 5/02 . by means of fastening members using screw-thread ([F16B 5/0004](#) takes precedence); construction of screw-threaded connections [F16B 25/00 - F16B 39/00](#))
- 5/0208 . . {using panel fasteners, i.e. permanent attachments allowing for quick assembly}
- 5/0216 . . {the position of the plates to be connected being adjustable}
- 5/0225 . . . {allowing for adjustment parallel to the plane of the plates}
- 5/0233 . . . {allowing for adjustment perpendicular to the plane of the plates}
- 5/0241 . . {with the possibility for the connection to absorb deformation, e.g. thermal or vibrational}
- 5/025 . . {specially designed to compensate for misalignment or to eliminate unwanted play}
- 5/0258 . . {using resiliently deformable sleeves, grommets or inserts ([F16B 43/001](#) takes precedence)}
- 5/0266 . . {using springs}
- 5/0275 . . {the screw-threaded element having at least two axially separated threaded portions ([F16B 5/0283](#) takes precedence)}
- 5/0283 . . {with an externally threaded sleeve around the neck or the head of the screw-threaded element for adjustably fastening a plate or frame or the like to a fixed element}
- 5/0291 . . {the threaded element being driven through the edge of a sheet plate with its axis in the plane of the plate}
- 5/04 . by means of riveting ([rivets F16B 19/04](#))
- 5/045 . . {without the use of separate rivets}
- 5/06 . by means of clamps or clips ([F16B 5/0004](#) takes precedence); friction-grip releasable fastenings in general [F16B 2/00](#))
- 5/0607 . . {joining sheets or plates to each other ([F16B 5/0692](#), [F16B 21/082](#) take precedence)}
- 5/0614 . . . {in angled relationship}
- 5/0621 . . . {in parallel relationship (fastened by a drive-pin [F16B 19/1081](#); fastened by a device locking by rotation [F16B 21/02](#))}
- 5/0628 . . . . {allowing for adjustment parallel or perpendicular to the plane of the sheets or plates}
- 5/0635 . . . . {fastened over the edges of the sheets or plates}
- 5/0642 . . . . {the plates being arranged one on top of the other and in full close contact with each other}
- 5/065 . . . . {the plates being one on top of the other and distanced from each other, e.g. by using protrusions to keep contact and distance}
- 5/0657 . . . . {at least one of the plates providing a raised structure, e.g. of the doghouse type, for connection with the clamps or clips of the other plate}
- 5/0664 . . . . {at least one of the sheets or plates having integrally formed or integrally connected snap-in-features}
- 2005/0671 . . . . {with unlocking by rotation}
- 2005/0678 . . . {in abutting relationship}
- 5/0685 . . {Joining sheets or plates to strips or bars ([F16B 5/0692](#) takes precedence)}
- 5/0692 . . {joining flexible sheets to other sheets or plates or to strips or bars ([tent fastenings E04H 15/64](#); coping elements for swimming pools with fixing means for sealing foil [E04H 4/142](#); greenhouses of flexible synthetic material [A01G 9/1407](#); end or aperture-closing arrangements or devices for sacks or bags [B65D 33/16](#))}
- 5/07 . by means of multiple interengaging protrusions on the surfaces, e.g. hooks, coils,
- 5/08 . by means of welds or the like ([welding B23K](#))
- 5/10 . by means of bayonet connections ([F16B 5/0092](#) takes precedence); fastening devices locking by rotation [F16B 21/02](#))
- 5/12 . Fastening strips or bars to sheets or plates, e.g. rubber strips, decorative strips for motor vehicles, by means of clips ([friction- grip releasable fastenings in general F16B 2/00](#); fastening rods or tubular parts to flat surfaces at an angle [F16B 9/00](#))
- 5/121 . . {fastened over the edge(s) of the sheet(s) or plate(s)}
- 5/123 . . {Auxiliary fasteners specially designed for this purpose}
- 5/125 . . . {one of the auxiliary fasteners is comprising wire or sheet material or is made thereof}
- 5/126 . . {at least one of the sheets, plates, bars or strips having integrally formed or integrally connected snap-in-features}
- 5/128 . . {a strip with a C- or U-shaped cross section being fastened to a plate such that the fastening means remain invisible, e.g. the fastening being completely enclosed by the strip}
- 7/00 Connections of rods or tubes, e.g. of non-circular section, mutually, including resilient connections ([F16B 11/008](#), [F16B 17/00](#) take precedence); umbrella frames [A45B 25/02](#); welding or soldering of connections [B23K](#); vehicle connections in general [B60D](#); railway couplings [B61G](#); bicycle frames [B62K](#); couplings for transmitting rotation [F16D](#); couplings for tubes conveying fluids [F16L](#))**
- 7/02 . with conical parts

- 7/025 . . {with the expansion of an element inside the tubes due to axial movement towards a wedge or conical element (for rods or tubes telescopically engaged [F16B 7/1463](#))}
- 7/04 . Clamping or clipping connections (friction-grip releasable fastenings in general [F16B 2/00](#))
- 7/0406 . . {for rods or tubes being coaxial ([F16B 7/10](#) takes precedence)}
- 7/0413 . . . {for tubes using the innerside thereof ([F16B 7/025](#) takes precedence)}
- 7/042 . . . . {with a locking element, e.g. pin, ball or pushbutton, engaging in a hole in the wall of at least one tube}
- 7/0426 . . . {for rods or for tubes without using the innerside thereof}
- 7/0433 . . {for rods or tubes being in parallel relationship}
- 7/044 . . {for rods or tubes being in angled relationship}
- 7/0446 . . . {for tubes using the innerside thereof ([F16B 7/025](#) takes precedence)}
- 7/0453 . . . . {the tubes being drawn towards each other ([F16B 7/0473](#) takes precedence)}
- 7/046 . . . . . {by rotating an eccentric-mechanism}
- 7/0466 . . . . . {by a screw-threaded stud with a conical tip acting on an inclined surface}
- 7/0473 . . . . {with hook-like parts gripping, e.g. by expanding, behind the flanges of a profile}
- 7/048 . . . {for rods or for tubes without using the innerside thereof}
- 7/0486 . . . . {forming an abutting connection of at least one tube}
- 7/0493 . . . . {forming a crossed-over connection}
- 7/06 . Turnbuckles (for cables, ropes, or wire [F16G 11/12](#))
- 7/10 . Telescoping systems ({for vertically adjustable chairs [A47C 3/20](#); telescopic steering columns [B62D 1/18](#)}; for scaffolding [E04G 25/04](#); {telescopic masts, poles or the like [E04H 12/182](#); telescopic door or window holders [E05C 17/30](#)}; telescope props for mining [E21D 15/14](#) - [E21D 15/46](#); stands or trestles as supports for apparatus or articles placed thereon ([F16M 11/26](#))}
- 7/105 . . {locking in discrete positions, e.g. in extreme extended position}
- 7/14 . . locking in intermediate {non-discrete} positions {(the rod or tube being locked by a tilting clip [F16B 2/246](#))}
- 7/1409 . . . {with balls or rollers urged by an axial displacement of a wedge or a conical member}
- 7/1418 . . . {with a clamping collar or two split clamping rings tightened by a screw or a cammed latch member}
- 7/1427 . . . {with cammed or eccentric surfaces co-operating by relative rotation of the telescoping members or by rotation of an external collar}
- 7/1436 . . . . {with rollers or balls}
- 7/1445 . . . {with a rubber bushing gripping inside the outer telescoping member by a radial expansion due to its axial compression ([F16B 7/1463](#) takes precedence)}
- 7/1454 . . . {with a clamp locking the telescoping members by swinging a handle provided with a locking cam ([F16B 7/1418](#) takes precedence)}
- 7/1463 . . . . {with the expansion of an element inside the outer telescoping member due to the axial movement towards a wedge or a conical member}
- 7/1472 . . . {with a clamping screw perpendicular to the axis of the telescoping members}
- 7/1481 . . . {with a gripping helical spring}
- 7/149 . . . {with a sleeve or ring having a tapered or conical surface ([F16B 7/1463](#) takes precedence)}
- 7/16 . . . locking only against movement in one direction
- 7/18 . using screw-thread elements {( [F16B 7/025](#) takes precedence; for turnbuckles [F16B 7/06](#))}
- 7/182 . . {for coaxial connections of two rods or tubes}
- 7/185 . . {with a node element}
- 7/187 . . {with sliding nuts or other additional connecting members for joining profiles provided with grooves or channels ([channel nuts per se F16B 37/045](#))}
- 7/20 . using bayonet connections
- 7/22 . using hooks or like elements
- 9/00** **Connections of rods or tubular parts to flat surfaces at an angle** ({with a part of or on one member entering a hole in the other and involving plastic deformation [F16B 17/006](#)}; friction-grip releasable fastenings in general [F16B 2/00](#); making press-fit connections [B23P 11/00](#), [B23P 19/00](#); fluid-tight connecting of pipes to reservoirs, sheets, or the like [F16L](#), e.g. joining pipes {or rods conveying fluids} to walls [F16L 41/00](#))
- WARNING**  
Group [F16B 9/00](#) is impacted by reclassification into groups [F16B 9/01](#), [F16B 9/05](#), [F16B 9/052](#), [F16B 9/054](#), [F16B 9/056](#), [F16B 9/058](#), [F16B 9/07](#), [F16B 9/09](#).  
All groups listed in this Warning should be considered in order to perform a complete search.
- 9/01 . {Welded or bonded connections}  
**WARNING**  
Group [F16B 9/01](#) is incomplete pending reclassification of documents from group [F16B 9/00](#).  
Groups [F16B 9/00](#) and [F16B 9/01](#) should be considered in order to perform a complete search.
- 9/02 . Detachable connections {( [F16B 9/05](#) – [F16B 9/09](#) take precedence)}  
**WARNING**  
Group [F16B 9/02](#) is impacted by reclassification into groups [F16B 9/05](#), [F16B 9/052](#), [F16B 9/054](#), [F16B 9/056](#), [F16B 9/058](#), [F16B 9/07](#), [F16B 9/09](#).  
All groups listed in this Warning should be considered in order to perform a complete search.

- 9/023 . . {using clamps or clips}  
(Frozen)

**WARNING**

Group [F16B 9/023](#) is no longer used for the classification of documents as of August 1, 2018. The content of this group is being reclassified into groups [F16B 9/02](#), [F16B 9/05](#), [F16B 9/052](#), [F16B 9/054](#), [F16B 9/056](#), [F16B 9/058](#), [F16B 9/07](#), [F16B 9/09](#).

All groups listed in this Warning should be considered in order to perform a complete search.

- 9/026 . . {using screw-thread elements}  
(Frozen)

**WARNING**

Group [F16B 9/026](#) is no longer used for the classification of documents as of August 1, 2018.

The content of this group is being reclassified into groups [F16B 9/02](#), [F16B 9/05](#), [F16B 9/052](#), [F16B 9/054](#), [F16B 9/056](#), [F16B 9/058](#), [F16B 9/07](#), [F16B 9/09](#).

All groups listed in this Warning should be considered in order to perform a complete search.

- 9/05 . . {by way of an intermediate member}

**WARNING**

Groups [F16B 9/05](#)-[F16B 9/058](#) are incomplete pending reclassification of documents from groups [F16B 9/00](#), [F16B 9/02](#) - [F16B 9/026](#) and [F16B 17/00](#).

Groups [F16B 9/00](#), [F16B 9/02](#) - [F16B 9/026](#), [F16B 9/05](#) - [F16B 9/058](#) and [F16B 17/00](#) should be considered in order to perform a complete search.

- 9/052 . . {the intermediate member having a radial flange secured to the flat surface}  
9/054 . . {the intermediate member being threaded}  
9/056 . . {the intermediate member extending through the flat surface; the rod or tubular part extending through the flat surface}  
9/058 . . {the intermediate member being secured to the rod by transverse fasteners}  
9/07 . . {involving plastic or elastic deformation when assembling (involving plastic deformation with a part of or on one member entering a hole in the other [F16B 17/006](#))}

**WARNING**

Group [F16B 9/07](#) is incomplete pending reclassification of documents from groups [F16B 9/00](#), [F16B 9/02](#) - [F16B 9/026](#) and [F16B 17/00](#).

Groups [F16B 9/00](#), [F16B 9/02](#) - [F16B 9/026](#), [F16B 9/07](#), and [F16B 17/00](#) should be considered in order to perform a complete search.

- 9/09 . . {rods and flat surfaces interengaging by projections and mating sockets}

**WARNING**

Group [F16B 9/09](#) is incomplete pending reclassification of documents from groups [F16B 9/00](#), [F16B 9/02](#) - [F16B 9/026](#) and [F16B 17/00](#).

Groups [F16B 9/00](#), [F16B 9/02](#) - [F16B 9/026](#), [F16B 9/09](#), and [F16B 17/00](#) should be considered in order to perform a complete search.

- 11/00 Connecting constructional elements or machine parts by sticking or pressing them together, e.g. cold pressure welding (non-electric welding in general [B23K](#); methods of using adhesives independently of the form of the surfaces joined [C09J 5/00](#))**

- 11/002 . . {by pressing the elements together so as to obtain plastic deformation (shrinkage connections, force fits [F16B 4/00](#); pin-and-hole connections involving plastic deformation [F16B 17/00](#))}  
11/004 . . {by cold pressure welding}  
11/006 . . {by gluing (gluing of plastics material [B29C 65/48](#))}  
11/008 . . {of tubular elements or rods in coaxial engagement}

- 12/00 Jointing of furniture or the like, e.g. hidden from exterior ([F16B 2/00](#) - [F16B 11/00](#) take precedence; fastening means per se [F16B 13/00](#) - [F16B 47/00](#); wood-working [B27](#))**

- 12/02 . . Joints between panels and corner posts  
12/04 . . Non-loosenable joints for non-metal furniture parts, e.g. glued  
2012/043 . . {using carpentry joints other than mortise and tenon joints, e.g. using multiple tenons}  
2012/046 . . {using mortise and tenon joints}  
12/06 . . Non-loosenable joints for metal furniture parts  
12/08 . . without use of separate connecting elements  
12/10 . . using pegs, bolts, tenons, clamps, clips, or the like (glued [F16B 12/04](#); fastening means per se [F16B 15/00](#) - [F16B 47/00](#))  
2012/103 . . {Sleeves or dowels for connection fittings}  
2012/106 . . {Connection bolts for connection fittings}  
12/12 . . for non-metal furniture parts, e.g. made of wood, of plastics  
12/125 . . . {using mortise and tenon joints}  
12/14 . . . using threaded bolts or screws  
2012/145 . . . . {Corner connections}  
12/16 . . . . using self-tapping screws  
12/18 . . . . using drawing bars  
12/20 . . . using clamps, clips, wedges, sliding bolts, or the like  
12/2009 . . . . {actuated by rotary motion}  
2012/2018 . . . . {pin and drum securing device; drum has cam surface to engage the head of the pin}  
12/2027 . . . . {with rotating excenters or wedges}  
12/2036 . . . . {with rotating excenters or wedges acting on a head of a pin or screw}  
2012/2045 . . . . {pin and drum securing device; drum has screw to engage the head of the pin}  
12/2054 . . . . {with engaging screw threads as securing means for limiting movement}



12/2063	. . . . . {with engaging screw threads as tightening means}	13/004	. . {with a drilling sleeve driven against a tapered or spherical plug}
2012/2072	. . . . . {Pin and drum securing devices; Drums having lever with cam surface to engage the head of the pin}	13/005	. {formed in integral series but easily separable}
2012/2081	. . . . . {having a fitting providing slanted access for a screwdriver as actuator}	2013/006	. {with sealing means}
2012/209	. . . . . {having an integrated lever as actuator}	2013/007	. {to be fastened in undercut holes}
12/22	. . . using keyhole-shaped slots and pins	2013/008	. {used for mining purposes}
12/24	. . . using separate pins, dowels, or the like	2013/009	. {Double sleeve dowels, i.e. the first sleeve is fixed in a hole by the action of a second sleeve and one of the sleeves receives a nail, a screw or the like}
12/26	. . . using snap-action elements	13/02	. in one piece with protrusions or ridges on the shaft
12/28	. . for metal furniture parts	13/025	. . {of rolled sheet material}
12/30	. . . using threaded bolts	13/04	. with parts gripping in the hole or behind the reverse side of the wall after inserting from the front ( <a href="#">F16B 13/002</a> and <a href="#">F16B 13/12</a> take precedence;) friction-grip releasable fastenings in general <a href="#">F16B 2/00</a> )
12/32	. . . using clamps, clips, wedges, sliding bolts, or the like	13/045	. . {having axially compressing parts allowing the clamping of an object tightly to the wall}
12/34	. . . using keyhole-shaped slots and pins	13/06	. . combined with expanding sleeve ( <a href="#">F16B 13/045</a> and <a href="#">F16B 13/08</a> take precedence)}
12/36	. . . using separate pins, dowels or the like	13/061	. . . {of the buckling type}
12/38	. . . using snap-action elements	13/063	. . . {by the use of an expander}
12/40	. Joints for furniture tubing	13/065	. . . . {fastened by extracting the screw, nail or the like}
2012/403	. . {with inserts for joining tubes coaxially}	13/066	. . . . {fastened by extracting a separate expander-part, actuated by the screw, nail or the like}
2012/406	. . {Cove joints for joining two cylindrical members}	13/068	. . . . . {expanded in two or more places}
12/42	. . connecting furniture tubing to non-tubular parts ( <a href="#">connecting table tops to underframes A47B 13/003</a> )	13/08	. . with separate {or non-separate} gripping parts moved into their final position in relation to the body of the device without further manual operation
12/44	. Leg joints; Corner joints	13/0808	. . . {by a toggle-mechanism}
2012/443	. . {with two-dimensional corner element, the legs thereof being inserted in hollow frame members}	13/0816	. . . {with a wedging drive-pin}
2012/446	. . {with three-dimensional corner element, the legs thereof being inserted in hollow frame members}	13/0825	. . . {with a locking element, e.g. sleeve, ring or key co-operating with a cammed or eccentric surface of the dowel body}
12/46	. . Non-metal corner connections	13/0833	. . . {with segments or fingers expanding or tilting into an undercut hole ( <a href="#">F16B 13/0858</a> takes precedence)}
2012/463	. . . {for wooden members without additional elements}	13/0841	. . . {with a deformable sleeve member driven against the abutting surface of the head of the bolt or of a plug}
2012/466	. . . {using mortise and tenon joints}	13/085	. . . {with a drive-nail deflected by an inclined surface in the dowel body ( <a href="#">nails with spreading shaft F16B 15/04</a> )}
12/48	. . Non-metal leg connections ( <a href="#">F16B 12/46</a> takes precedence)	13/0858	. . . {with an expansible sleeve or dowel body driven against a tapered or spherical expander plug ( <a href="#">F16B 13/004</a> takes precedence)}
12/50	. . Metal corner connections	13/0866	. . . {with prongs penetrating into the wall of the hole by a retractile movement of a threaded member}
2012/505	. . . {having a corner insert which is inserted in mitered profiled members}	13/0875	. . . {with elastic discs or spring washers anchoring in the hole}
12/52	. . Metal leg connections ( <a href="#">F16B 12/50</a> takes precedence)	13/0883	. . . {with split rings or wire between the threads of the dowel body or in grooves near a conical surface ( <a href="#">F16B 13/0825</a> takes precedence)}
12/54	. Fittings for bedsteads or the like	13/0891	. . . {with a locking element, e.g. wedge, key or ball moving along an inclined surface of the dowel body ( <a href="#">F16B 13/0816</a> , <a href="#">F16B 13/0825</a> , <a href="#">F16B 13/0883</a> take precedence)}
12/56	. . Brackets for bedsteads; Coupling joints consisting of bolts or the like; Latches therefor	13/10	. . with separate gripping parts moved into their final position in relation to the body of the device by a separate operation ( <a href="#">F16B 13/06</a> takes precedence)
12/58	. . Tapered connectors for bed rails		
12/60	. . Fittings for detachable side panels		
<b>13/00</b>	<b>Dowels or other devices fastened in walls or the like by inserting them in holes made therein for that purpose (<a href="#">nails F16B 15/00</a>; self-locking pins or bolts in general, stud-and-socket releasable fastenings <a href="#">F16B 21/00</a>; dowels or bolts for railroad sleepers <a href="#">E01B 9/00</a>; ans means for anchoring structural elements or bulkheads specially adapted to foundation engineering <a href="#">E02D 5/74</a>; bolts or dowels used while laying bricks or casting concrete sleepers <a href="#">E04B 1/38</a>; setting anchoring bolts in shafts, tunnels or galleries <a href="#">E21D 20/00</a>; anchoring bolts for shafts, tunnels or galleries <a href="#">E21D 21/00</a>)</b>		
13/001	. {with means for preventing rotation of the dowel}		
13/002	. {self-cutting}		
13/003	. . {with a separate drilling bit attached to or surrounded by the dowel element}		

- 13/12 . Separate metal {or non-separate or non-metal} dowel sleeves fastened by inserting the screw, nail or the like {(F16B 13/0808 takes precedence)}
- 13/122 . . {made from a sheet-metal blank}
- 13/124 . . {fastened by inserting a threaded element, e.g. screw or bolt (F16B 13/122, F16B 13/128 take precedence)}
- 13/126 . . {fastened by inserting an unthreaded element, e.g. pin or nail (F16B 13/122, F16B 13/128 take precedence)}
- 13/128 . . {with extending protrusions, e.g. discs, segments, ridges, fingers or tongues (F16B 13/122 takes precedence)}
- 13/14 . Non-metallic plugs or sleeves {(not used, see F16B 13/002- F16B 13/12)}; Use of liquid, loose solid or kneadable material therefor
- 13/141 . . {Fixing plugs in holes by the use of settable material}
- 13/142 . . . {characterised by the composition of the setting material or mixture (F16B 13/143 takes precedence)}
- 13/143 . . . {using frangible cartridges or capsules containing the setting components}
- 13/144 . . . . {characterised by the shape or configuration or material of the frangible cartridges or capsules}
- 13/145 . . . . {characterised by the composition of the setting agents contained in the frangible cartridges or capsules}
- 13/146 . . . {with a bag-shaped envelope or a tubular sleeve closed at one end, e.g. with a sieve-like sleeve, or with an expandable sheath}
- 2013/147 . . . {Grout with reinforcing elements or with fillers, e.g. fibres, flakes, balls, wires}
- 2013/148 . . . {Means for inhibiting adhesion between dowel or anchor bolt parts and the surrounding grouting composition}

**Fastening means without screw-thread** (horseshoe nails A01L 7/10; nails for footwear A43B 23/20; thumb- tacks B43M 15/00; for building constructions E04B 1/38; for hand railings E04F 11/18; for fencing E04H 17/00)

- 15/00 Nails; Staples** (surgical staples A61B 17/064; manufacture of nails or staples B21G {}; drawing-pins, thumb-tacks B43M 15/00); railway spikes E01B 9/06)
- 15/0007 . {with two nail points extending in opposite directions, in order to fix two workpieces together}
- 15/0015 . {Staples}
- 15/0023 . {Nail plates (claw dowels for building structures E04B 1/49; machines for driving in nail plates B27F 7/15)}
- 15/003 . . {with teeth cut out from the material of the plate}
- 15/0038 . . . {only on the perimeter of the plate}
- 15/0046 . . . {from the body of the plate}
- 15/0053 . . {with separate nails attached to the plate}
- 2015/0061 . . {Multipiece-plates}
- 2015/0069 . . {with nails on both sides}
- 2015/0076 . . {with provisions for additional fastening means, e.g. hooks, holes for separate screws or nails, adhesive}
- 2015/0084 . . {with marks to indicate where to strike with the hammer}
- 15/0092 . {Coated nails or staples}

- 15/02 . with specially-shaped heads, e.g. with enlarged surfaces (ornaments for furniture A47B 95/04; removable ornamental heads for nails A47G 3/00)
- 15/04 . with spreading shaft {(dowels with a drive-nail deflected by an inclined surface in the dowel body F16B 13/085)}
- 15/06 . with barbs, e.g. for metal parts; Drive screws
- 15/08 . formed in integral series but easily separable
- 17/00 Connecting constructional elements or machine parts by a part of or on one member entering a hole in the other {and involving plastic deformation}** (riveting F16B 19/04)
- WARNING**
- Group F16B 17/00 is impacted by reclassification into groups F16B 9/02, F16B 9/05 - F16B 9/09.
- All groups listed in this Warning should be considered in order to perform a complete search.
- 17/004 . {of rods or tubes mutually}
- 17/006 . {of rods or tubes to sheets or plates}
- 17/008 . {of sheets or plates mutually (joining sheets by riveting without the use of separate rivets F16B 5/045)}
- 19/00 Bolts without screw-thread; Pins, including deformable elements** (in screwed connections F16B 29/00); **Rivets** (means for preventing withdrawal F16B 21/00)
- 19/002 . {Resiliently deformable pins (F16B 21/06 takes precedence)}
- 19/004 . . {made in one piece (F16B 21/084 takes precedence)}
- 2019/006 . . {made in a plurality of pieces}
- 19/008 . {with sealing means}
- 19/02 . Bolts or sleeves for positioning of machine parts, e.g. notched taper pins, fitting pins, sleeves, eccentric positioning rings
- 19/04 . Rivets; Spigots or the like fastened by riveting (lead seals G09F 3/00)
- 2019/045 . . {Coated rivets}
- 19/05 . . Bolts fastening by swaged-on collars (F16B 19/08 takes precedence)
- 2019/055 . . . {deformed by an electro-magnetic action}
- 19/06 . . Solid rivets made in one piece
- 19/08 . . Hollow rivets; Multi-part rivets
- 19/083 . . . {Self-drilling rivets}
- 19/086 . . . {Self-piercing rivets}
- 19/10 . . . fastened by expanding mechanically
- NOTES**
- 1. Subject matter relating to hollow or single-part rivets fastened by a pull-through mandrel is classified in F16B 19/1045
- 2. Subject matter relating to hollow or single-part rivets fastened by a drive pin is classified in F16B 19/1081
- 2019/1009 . . . . {hollow or single-part rivets fastened by a pull-through mandrel}
- 2019/1018 . . . . {hollow or single-part rivets fastened by a drive pin}
- 19/1027 . . . . {Multi-part rivets}
- 19/1036 . . . . {Blind rivets}

19/1045	. . . . . {fastened by a pull - mandrel or the like (F16B 19/109 takes precedence)}	21/082	. . . {the stud, pin or spigot having two resilient parts on its opposite ends in order to connect two elements}
19/1054	. . . . . {the pull-mandrel or the like being frangible}	21/084	. . . {with a series of flexible ribs or fins extending laterally from the shank of the stud, pin or spigot, said ribs or fins deforming predominantly in a direction parallel to the direction of insertion of the shank}
19/1063	. . . . . {with a sleeve or collar sliding over the hollow rivet body during the pulling operation}	21/086	. . . {the shank of the stud, pin or spigot having elevations, ribs, fins or prongs intended for deformation or tilting predominantly in a direction perpendicular to the direction of insertion}
19/1072	. . . . . {the pull-mandrel or the like comprising a thread and being rotated with respect to the rivet, thereby mechanically expanding and fastening the rivet (nuts fastened by riveting F16B 37/067)}	21/088	. . . {the stud, pin or spigot being integrally formed with the component to be fastened, e.g. forming part of the sheet, plate or strip}
19/1081	. . . . . {fastened by a drive-pin (F16B 19/109 takes precedence)}	21/09	. Releasable fastening devices with a stud engaging a keyhole slot
19/109	. . . . . {Temporary rivets, e.g. with a spring-loaded pin (special clamping devices for workpieces to be riveted together, e.g. operating through the rivet holes B21J 15/42; hand tools for temporarily connecting sheets before or during assembly operations B25B 31/005)}	21/10	. by separate parts ({F16B 21/06 takes precedence}; key-type connection F16B 3/00; locking screws or nuts against rotation by such means F16B 39/04)
19/12	. . . fastened by fluid pressure, including by explosion (bolts shot by means of detonation-operated nailing tools into concrete constructions, metal walls or the like F16B 19/14)	21/12	. . with locking-pins or split-pins thrust into holes
19/125	. . . . {fastened by explosion}	21/125	. . . {radially resilient or with a snap-action member, e.g. elastic tooth, pawl with spring, resilient coil or wire}
19/14	. Bolts or the like for shooting into concrete constructions, metal walls or the like by means of detonation-operated nailing tools (tools therefor B25C, B27F)	21/14	. . . Details of locking-pins or split-pins
21/00	<b>Means for preventing relative axial movement of a pin, spigot, shaft or the like and a member surrounding it (riveted or deformable spigots F16B 19/04; for gudgeon pins F16J 1/18); Stud-and-socket releasable fastenings</b>	21/16	. . with grooves or notches in the pin or shaft
21/02	. Releasable fastening devices locking by rotation (with snap-action F16B 21/06; studs or coupling pins with resilient protrusions F16B 21/08)	21/165	. . . {with balls or rollers (for connections of rods or tubes engaged telescopically F16B 7/1409)}
21/04	. . with bayonet catch	21/18	. . . with circlips or like resilient retaining devices, {i.e. resilient in the plane of the ring or the like}; Details (spring-washers for locking nuts F16B 39/24; adjusting rings F16B 43/00)
21/06	. Releasable fastening devices with snap-action {(quickly-detachable or mountable nuts to threaded bolts F16B 37/0842)}	21/183	. . . . {internal, i.e. with spreading action}
21/065	. . {with an additional locking element}	21/186	. . . . {external, i.e. with contracting action}
21/07	. . in which the socket has a resilient part {(F16B 21/065 takes precedence)}	21/20	. . for bolts or shafts without holes, grooves, or notches for locking members {(by rings resilient in their plane F16B 21/18)}
21/071	. . . {the socket being integrally formed with a component to be fasted, e.g. a sheet, plate or strip}	21/205	. . . {the connecting means having gripping edges in the form of a helix}
21/073	. . . {the socket having a resilient part on its inside}	<b>Fastening means using screw-thread</b> (wall-dowels F16B 13/00; manufacture of threaded fastening means B21H, B21K, B23G; screws or bolts for railway sleepers E01B 9/10; screw mechanisms F16H)	
21/075	. . . . {the socket having resilient parts on its inside and outside}	23/00	<b>Specially shaped {nuts or} heads of bolts or screws for rotations by a tool {(detachable ornamental heads for screws A47G 3/00; screwdrivers, wrenches B25B)}</b>
21/076	. . . {the socket having a resilient part on its outside (F16B 21/075 takes precedence)}	23/0007	. {characterised by the shape of the recess or the protrusion engaging the tool (F16B 23/0069 and F16B 23/0076 take precedence)}
21/078	. . . {the socket having a further molded-in or embedded component, e.g. a ring with snap-in teeth molded into it (F16B 21/065 takes precedence)}	23/0015	. . {substantially rectangular, e.g. one-slot head}
21/08	. . in which the stud, pin, or spigot has a resilient part ({F16B 21/065, F16B 21/125, F16B 21/165, F16B 37/043 take precedence}); wall-dowels F16B 13/00)	23/0023	. . {substantially cross-shaped}
		23/003	. . {star-shaped or multi-lobular, e.g. Torx-type, twelve-point star}
		23/0038	. . {substantially prismatic with up to six edges, e.g. triangular, square, pentagonal, Allen-type cross-sections}
		23/0046	. . {having one eccentric circular or polygonal recess or protrusion}
		23/0053	. {with a conical or prismatic recess for receiving a centering pin of the tool apparatus}



23/0061	• {with grooves, notches or splines on the external peripheral surface designed for tools engaging in radial direction ( <a href="#">F16B 23/003</a> takes precedence)}	27/00	<b>Bolts, screws, or nuts formed in integral series but easily separable, particularly for use in automatic machines</b> {(arrangements for feeding screws or nuts in spanners, wrenches or screw-drivers with built-in magazines <a href="#">B25B 23/06</a> )}
23/0069	• {with holes to be engaged with corresponding pins on the tool or protruding pins to be engaged with corresponding holes on the tool}	29/00	<b>Screwed connection with deformation of nut or auxiliary member while fastening</b> ({Nuts fastened to surfaces by riveting <a href="#">F16B 37/065</a> ; members deformed for locking screws, bolts or nuts <a href="#">F16B 39/22</a> )}
23/0076	• {causing slipping of the tool in loosening rotation, i.e. disabling unscrewing unless another tool is used ( <a href="#">F16B 31/027</a> takes precedence)}	31/00	<b>Screwed connections specially modified in view of tensile load; Break-bolts</b> (shape of thread ( <a href="#">F16B 33/02</a> ; in couplings <a href="#">F16D 9/00</a> ))
23/0084	• {with a threaded engagement between the head of the bolt or screw and the tool}	2031/002	• {Breakbolts loosening due to an electromagnetic action}
23/0092	• {with a head engageable by two or more different tools ( <a href="#">F16B 23/0076</a> takes precedence)}	31/005	• {Breakbolts loosening due to the action of an explosive charge}
<b>25/00</b>	<b>Screws that cut thread in the body into which they are screwed, e.g. wood screws</b> {( <a href="#">F16B 35/065</a> takes precedence; joining sheets or plates using screws with two separate threads <a href="#">F16B 5/0275</a> , using screws with adjustment sleeves <a href="#">F16B 5/0283</a> )}	31/007	• {Break-bolts loosening at high temperature}
25/0005	• {of the helical wire type (threaded wire-inserts <a href="#">F16B 37/12</a> )}	31/02	• for indicating {the attainment of a particular tensile load} or limiting tensile load {(apparatus for, or method of, determining value of torque or twisting moment for tightening a nut or other member similarly stressed <a href="#">G01L 5/24</a> )}
25/001	• {characterised by the material of the body into which the screw is screwed}	31/021	• • {by means of a frangible part ( <a href="#">F16B 31/025</a> , <a href="#">F16B 31/028</a> take precedence; break members in torque limiters or torque indicators in wrenches or screwdrivers <a href="#">B25B 23/1415</a> )}
25/0015	• • {the material being a soft organic material, e.g. wood or plastic ( <a href="#">F16B 25/0031</a> takes precedence)}	2031/022	• • {using an ultrasonic transducer}
25/0021	• • {the material being metal, e.g. sheet-metal or aluminium ( <a href="#">F16B 25/0031</a> takes precedence)}	31/024	• • {with the bottom of the nut or of the head of the bolt having gaps which close as the bolt tension increases, e.g. with lips or with a load-indicating flange}
25/0026	• • {the material being a hard non-organic material, e.g. stone, concrete or drywall ( <a href="#">F16B 25/0031</a> takes precedence)}	31/025	• • {with a gauge pin in a longitudinal bore in the body of the bolt}
25/0031	• • {the screw being designed to be screwed into different materials, e.g. a layered structure or through metallic and wooden parts}	31/027	• • {with a bolt head causing the fastening or the unfastening tool to lose the grip when a specified torque is exceeded}
25/0036	• {characterised by geometric details of the screw}	31/028	• • {with a load-indicating washer or washer assembly}
25/0042	• • {characterised by the geometry of the thread, the thread being a ridge wrapped around the shaft of the screw}	31/04	• for maintaining {a} tensile load
25/0047	• • • {the ridge being characterised by its cross-section in the plane of the shaft axis}	31/043	• • {Prestressed connections tensioned by means of liquid, grease, rubber, explosive charge, or the like ( <a href="#">hydraulic bolt tensioners B25B 29/02</a> )}
25/0052	• • • {the ridge having indentations, notches or the like in order to improve the cutting behaviour}	2031/046	• • • {by means of an explosive charge}
25/0057	• • • {the screw having distinct axial zones, e.g. multiple axial thread sections with different pitch or thread cross-sections}	31/06	• having regard to possibility of fatigue rupture
25/0063	• • • • {with a non-threaded portion on the shaft of the screw}	<b>33/00</b>	<b>Features common to bolt and nut</b>
25/0068	• • • • {with multiple-threads, e.g. a double thread screws}	33/002	• {Means for preventing rotation of screw-threaded elements ( <a href="#">F16B 39/00</a> takes precedence)}
25/0073	• • • • {characterised by its pitch, e.g. a varying pitch}	33/004	• {Sealing; Insulation (by means of washers <a href="#">F16B 43/001</a> )}
25/0078	• • {with a shaft of non-circular cross-section or other special geometric features of the shaft}	33/006	• {Non-metallic fasteners using screw-thread}
25/0084	• • {characterised by geometric details of the tip}	33/008	• {Corrosion preventing means}
25/0089	• • {the screw having wings}	33/02	• Shape of thread; Special thread-forms (( <a href="#">F16B 25/00</a> takes precedence; used to remove paint or dirt layers <a href="#">F16B 35/007</a> , <a href="#">F16B 37/002</a> ); used as screw-locking device <a href="#">F16B 39/30</a> )
25/0094	• • {the screw being assembled or manufactured from several components, e.g. a tip out of a first material welded to shaft of a second material}	2033/025	• • {with left-hand thread}
25/10	• Screws performing an additional function to thread-forming, e.g. drill screws {or self-piercing screws}	33/04	• • in view of tensile load
25/103	• • {by means of a drilling screw-point, i.e. with a cutting and material removing action}		
25/106	• • {by means of a self-piercing screw-point, i.e. without removing material}		

33/06	<ul style="list-style-type: none"> <li>Surface treatment of parts furnished with screw-thread, e.g. for preventing seizure {or fretting (corrosion preventing means <a href="#">F16B 33/008</a>; settable coatings for locking threaded members <a href="#">F16B 39/225</a>; deformable coatings for locking threaded members <a href="#">F16B 39/34</a>)}</li> </ul>	37/046	<ul style="list-style-type: none"> <li>. . . {with resilient means for urging the nut inside the channel}</li> </ul>
<b>35/00</b>	<b>Screw-bolts; Stay-bolts; Screw-threaded studs; Screws; Set screws</b> (( <a href="#">F16B 33/008</a> takes precedence; joining sheets or plates using screws with two separate threads <a href="#">F16B 5/0275</a> ; using screws with adjustment sleeves <a href="#">F16B 5/0283</a> ); thread cutting screws <a href="#">F16B 25/00</a> )	37/047	<ul style="list-style-type: none"> <li>. . . {Barrel nuts}</li> </ul>
	<b>NOTE</b>	37/048	<ul style="list-style-type: none"> <li>. . . {Non-releasable devices (<a href="#">F16B 37/044</a>, <a href="#">F16B 37/045</a> and <a href="#">F16B 37/06</a> take precedence)}</li> </ul>
	The fastening of heads of screws or heads of bolts to surfaces is classified in <a href="#">F16B 37/04</a>	37/06	<ul style="list-style-type: none"> <li>. . by means of welding or riveting</li> </ul>
35/002	<ul style="list-style-type: none"> <li>{onto which threads are cut during screwing (<a href="#">F16B 37/002</a> takes precedence)}</li> </ul>	37/061	<ul style="list-style-type: none"> <li>. . . {by means of welding}</li> </ul>
35/005	<ul style="list-style-type: none"> <li>{Set screws; Locking means therefor}</li> </ul>	37/062	<ul style="list-style-type: none"> <li>. . . {by means of riveting}</li> </ul>
35/007	<ul style="list-style-type: none"> <li>{Removing paint or dirt layers covering the threaded part of nut-like members}</li> </ul>	37/064	<ul style="list-style-type: none"> <li>. . . . {with the use of separate rivets}</li> </ul>
35/02	<ul style="list-style-type: none"> <li>divided longitudinally</li> </ul>	37/065	<ul style="list-style-type: none"> <li>. . . . {by deforming the material of the nut}</li> </ul>
35/04	<ul style="list-style-type: none"> <li>with specially-shaped head or shaft in order to fix the bolt on or in an object (locking the bolt against turning in the object by the use of accessory parts <a href="#">F16B 39/00</a>)</li> </ul>	37/067	<ul style="list-style-type: none"> <li>. . . . . {the material of the nut being deformed by a threaded member generating axial movement of the threaded part of the nut, e.g. blind rivet type}</li> </ul>
35/041	<ul style="list-style-type: none"> <li>. . {Specially-shaped shafts (shape of thread <a href="#">F16B 33/02</a>)}</li> </ul>	37/068	<ul style="list-style-type: none"> <li>. . . . {by deforming the material of the support, e.g. the sheet or plate}</li> </ul>
35/042	<ul style="list-style-type: none"> <li>. . . {for retention or rotation by a tool, e.g. of polygonal cross-section}</li> </ul>	37/08	<ul style="list-style-type: none"> <li>. Quickly-detachable {or mountable} nuts, e.g. consisting of two or more parts; Nuts movable along the bolt after tilting the nut</li> </ul>
35/044	<ul style="list-style-type: none"> <li>. . . {Specially-shaped ends}</li> </ul>	37/0807	<ul style="list-style-type: none"> <li>. . {Nuts engaged from the end of the bolt, e.g. axially slidable nuts}</li> </ul>
35/045	<ul style="list-style-type: none"> <li>. . . . {for retention or rotation by a tool (specially shaped heads of bolts or screws for rotation by a tool <a href="#">F16B 23/00</a>)}</li> </ul>	37/0814	<ul style="list-style-type: none"> <li>. . . {movable along the bolt after tilting the nut}</li> </ul>
35/047	<ul style="list-style-type: none"> <li>. . . . {for preventing cross-threading, i.e. preventing skewing of bolt and nut}</li> </ul>	37/0821	<ul style="list-style-type: none"> <li>. . . {in two halves pivotally connected}</li> </ul>
35/048	<ul style="list-style-type: none"> <li>. . . {Specially-shaped necks (<a href="#">F16B 35/06</a> takes precedence)}</li> </ul>	37/0828	<ul style="list-style-type: none"> <li>. . . {with a longitudinal slit through the annular wall of the nut for enabling expansion of the nut, e.g. for easy removal}</li> </ul>
35/06	<ul style="list-style-type: none"> <li>. . Specially-shaped heads (special shape in order to rotate the bolt <a href="#">F16B 23/00</a> ; separate hook adaptors for bolts <a href="#">F16B 43/025</a>)</li> </ul>	37/0835	<ul style="list-style-type: none"> <li>. . . {with balls engaging threads or grooves on the shaft of the bolt}</li> </ul>
35/065	<ul style="list-style-type: none"> <li>. . . {with self-countersink-cutting means}</li> </ul>	37/0842	<ul style="list-style-type: none"> <li>. . . {fastened to the threaded bolt with snap-on-action, e.g. push-on nuts for stud bolts (<a href="#">F16B 37/0857</a> takes precedence; snap-on-action of a pin, spigot, shaft or the like and a member surrounding it <a href="#">F16B 21/06</a>)}</li> </ul>
<b>37/00</b>	<b>Nuts or like thread-engaging members</b> {(specially shaped for rotations by a tool <a href="#">F16B 23/00</a> )}	37/085	<ul style="list-style-type: none"> <li>. . . {with at least one unthreaded portion in both the nut and the bolt}</li> </ul>
37/002	<ul style="list-style-type: none"> <li>{cutting threads during screwing; removing paint or dirt layers covering threaded shanks}</li> </ul>	37/0857	<ul style="list-style-type: none"> <li>. . . {with the threaded portions of the nut engaging the thread of the bolt by the action of one or more springs or resilient retaining members (<a href="#">F16B 37/0821</a> and <a href="#">F16B 37/0835</a> take precedence)}</li> </ul>
37/005	<ul style="list-style-type: none"> <li>{into which threads are cut during screwing}</li> </ul>	37/0864	<ul style="list-style-type: none"> <li>. . . {with the threaded portions of the nut engaging the thread of the bolt by pressing or rotating an external retaining member such as a cap, a nut, a ring or a sleeve (<a href="#">F16B 37/0835</a> takes precedence)}</li> </ul>
2037/007	<ul style="list-style-type: none"> <li>{with a blind hole}</li> </ul>	37/0871	<ul style="list-style-type: none"> <li>. . {engaging the bolt laterally, i.e. without the need to engage the end of the bolt}</li> </ul>
37/02	<ul style="list-style-type: none"> <li>made of thin sheet material (fastening to surfaces <a href="#">F16B 37/04</a> ; used as lock-nuts <a href="#">F16B 39/14</a>)</li> </ul>	37/0878	<ul style="list-style-type: none"> <li>. . . {in one piece, e.g. C-shaped nuts}</li> </ul>
37/04	<ul style="list-style-type: none"> <li>Devices for fastening nuts to surfaces, e.g. sheets, plates {(nuts fastened behind a wall by a toggle-mechanism <a href="#">F16B 13/0808</a>; threaded inserts <a href="#">F16B 37/122</a>; measures against loss of bolts, nuts or pins <a href="#">F16B 41/002</a>)}</li> </ul>	37/0885	<ul style="list-style-type: none"> <li>. . . {in two halves hingedly connected}</li> </ul>
37/041	<ul style="list-style-type: none"> <li>. . {Releasable devices (<a href="#">F16B 37/044</a>, <a href="#">F16B 37/045</a> take precedence)}</li> </ul>	37/0892	<ul style="list-style-type: none"> <li>. . . {in two or more pieces, e.g. assemblies made by two C-shaped nuts mutually interlocked, or retained by an additional member (<a href="#">F16B 37/0885</a> takes precedence)}</li> </ul>
37/042	<ul style="list-style-type: none"> <li>. . . {locking by rotation}</li> </ul>	37/12	<ul style="list-style-type: none"> <li>. with thread-engaging surfaces formed by inserted coil-springs, discs, or the like; Independent pieces of wound wire used as nuts; Threaded inserts for holes {(mounting devices <a href="#">B25B 27/143</a>)}</li> </ul>
37/043	<ul style="list-style-type: none"> <li>. . . {with snap action}</li> </ul>	37/122	<ul style="list-style-type: none"> <li>. . {Threaded inserts, e.g. "rampa bolts"}</li> </ul>
37/044	<ul style="list-style-type: none"> <li>. . {Nut cages}</li> </ul>	37/125	<ul style="list-style-type: none"> <li>. . . {the external surface of the insert being threaded}</li> </ul>
37/045	<ul style="list-style-type: none"> <li>. . {specially adapted for fastening in channels, e.g. sliding bolts, channel nuts}</li> </ul>	37/127	<ul style="list-style-type: none"> <li>. . . . {and self-tapping}</li> </ul>
		37/14	<ul style="list-style-type: none"> <li>. Cap nuts; Nut caps or bolt caps</li> </ul>
		37/145	<ul style="list-style-type: none"> <li>. . {Sleeve nuts, e.g. combined with bolts}</li> </ul>
		37/16	<ul style="list-style-type: none"> <li>. Wing-nuts (<a href="#">F16B 37/14</a> takes precedence)</li> </ul>

**39/00** **Locking of screws, bolts or nuts** ([F16B 35/005](#) takes precedence); locking of bottle closures [B65D](#); locking of rail-fastening bolts for permanent ways [E01B 9/12](#); locking of fastening means for railway fishplates [E01B 11/38](#); locking devices for valves or cocks [F16K](#))

**NOTE**

In this group, heads of screws or bolts are put on a par with nuts as far as pertains to locking; an object into which a screw is threaded is put on a par with a nut.

- 39/01 . specially adapted to prevent loosening at extreme temperatures
- 39/02 . in which the locking takes place after screwing down ([F16B 39/01](#) takes precedence; split-pins, circlips, or the like for preventing relative axial movement only [F16B 21/10](#); fastening nuts by welding or riveting [F16B 37/06](#))
- 39/021 . . {by injecting a settable material after the screwing down}
- 39/023 . . {by driving a conic or wedge-shaped expander through the threaded element}
- 39/025 . . {by plastic deformation of a part of one of the threaded elements into a notch or cavity of the other threaded element ([F16B 39/103](#) and [F16B 39/106](#) take precedence)}
- 39/026 . . {by swaging the nut on the bolt, i.e. by plastically deforming the nut}
- 39/028 . . {by means of an auxiliary bolt or threaded element whose action provokes the deformation of the main bolt or nut and thereby its blocking}
- 39/04 . . with a member penetrating the screw-threaded surface of at least one part, e.g. a pin, a wedge, cotter-pin, screw
- 39/06 . . . with a pin or staple parallel to the bolt axis
- 39/08 . . with a cap interacting with the nut, connected to the bolt by a pin or cotter pin
- 39/10 . . by a plate, {spring, wire} or ring immovable with regard to the bolt or object {and mainly perpendicular to the axis of the bolt} ([F16B 39/08](#) takes precedence)
- 39/101 . . . {with a plate, spring, wire or ring holding two or more nuts or bolt heads which are mainly in the same plane}
- 39/103 . . . {with a locking cup washer, ring or sleeve surrounding the nut or bolt head and being partially deformed on the nut or bolt head, or on the object itself}
- 39/105 . . . {locking the bolt head or nut into a hole or cavity, e.g. with the cup washer, ring or sleeve deformed into a dimple in the cavity}
- 39/106 . . . {with a deformable locking element, e.g. disk or pin above the bolt head or nut, flattened into a hole or cavity within which the bolt head or nut is positioned}
- 39/108 . . . {with a locking washer under the nut or bolt head having at least one tongue or lug folded against the nut or bolt head, or against the object itself ([F16B 39/103](#) takes precedence)}
- 39/12 . . by means of locknuts
- 39/122 . . . {foreseen with mating surfaces inclined, i.e. not normal, to the bolt axis}
- 39/124 . . . . {with helically inclined mating surfaces}

- 39/126 . . . {causing radial forces on the bolt-shaft ([F16B 39/36](#) takes precedence)}
- 39/128 . . . . {by means of eccentric or spiral interengaging parts}
- 39/14 . . . made of thin sheet material or formed as spring-washers (locknuts *per se* made of thin sheet metal [F16B 37/02](#))
- 39/16 . . . in which the screw-thread of the locknut differs from that of the nut
- 39/18 . . . . in which the locknut grips with screw-thread in the nuts as well as on the bolt
- 39/20 . . by means of steel wire or the like ([F16B 39/10](#) takes precedence)
- 39/22 . in which the locking takes place during screwing down or tightening ([F16B 39/01](#) takes precedence)
- 39/225 . . {by means of a settable material}
- 39/24 . . by means of washers, spring washers, or resilient plates that lock against the object (locking to the screw-thread [F16B 39/14](#) {, [F16B 39/34](#)}, [F16B 39/36](#))
- 39/26 . . . with spring washers fastened to the nut or bolt-head
- 39/28 . . by special members on, or shape of, the nut or bolt ([F16B 39/26](#) takes precedence; locknuts [F16B 39/12](#))
- 39/282 . . . Locking by means of special shape of work-engaging surfaces, e.g. notched or toothed nuts
- 39/2825 . . . . {causing the bolt to tilt}
- 39/284 . . . Locking by means of elastic deformation (([F16B 39/2825](#), [F16B 39/36](#),) [F16B 39/38](#) take precedence)
- 39/286 . . . . caused by saw cuts
- 39/30 . . . Locking exclusively by special shape of the screw-thread
- 39/32 . . . Locking by means of a pawl or pawl-like tongue
- 39/34 . . . Locking by deformable inserts or like parts
- 39/36 . . . with conical locking parts, which may be split, including use of separate rings co-operating therewith
- 39/38 . . . with a second part of the screw-thread which may be resiliently mounted ([F16B 39/30](#) takes precedence)

- 41/00** **Measures against loss of bolts, nuts, or pins; Measures against unauthorised operation of bolts, nuts or pins** ({locking of screws, bolts or nuts [F16B 39/00](#); } seals [G09F 3/00](#))
- 41/002 . {Measures against loss of bolts, nuts or pins (devices for fastening nuts to surfaces [F16B 37/04](#))}
- 41/005 . {Measures against unauthorised operation of bolts, nuts or pins ([F16B 23/0007](#), [F16B 23/0061](#), [F16B 23/0069](#), [F16B 23/0076](#) and [F16B 31/02](#) take precedence; locks, keys [E05B](#); for valves, taps or cocks [F16K 35/00](#); for pipe-joints with swivel-nuts [F16L 19/005](#))}
- 41/007 . . {by means of two housings hingedly connected which enclose the bolt head}
- 43/00** **Washers or equivalent devices; Other devices for supporting bolt-heads or nuts** (circlips [F16B 21/18](#); {for indicating tensile load [F16B 31/02](#); forming a whole with the bolt or nut [F16B 33/00](#); locking bolts or nuts by means of a fixed plate or ring, or washer-like resilient plates [F16B 39/10](#), [F16B 39/24](#)})

- 43/001 . {for sealing or insulation}
- 43/002 . {with special provisions for reducing friction}
- 43/003 . {with a special hole shape in order to allow a quick mounting or dismounting of the washer, e.g. with a keyhole slot ([F16B 43/005](#) takes precedence)}
- 43/004 . {with a radial cut in order to improve elasticity of the washer ([F16B 43/005](#) takes precedence)}
- 43/005 . {engaging the bolt laterally to allow a quick mounting or dismounting of the washer, i.e. without the need to engage over the end of the bolt ([F16B 43/009](#) takes precedence)}
- 43/006 . . {in two or more parts hingedly connected}
- 43/007 . . {in two or more parts}
- 2043/008 . {with a cavity for receiving the bolt head in order to make a flush surface}
- 43/009 . {with a wedging effect in order to adjust the height of the washer}
- 43/02 . with special provisions for engaging surfaces which are not perpendicular to a bolt axis or do not surround the bolt
- 43/025 . . {for surfaces not surrounding the bolt, e.g. hook adaptors for bolts}
- 45/00** **Hooks; Eyes** (if the attaching parts or means are concerned, groups [F16B 13/00](#), [F16B 15/00](#), [F16B 19/00](#), [F16B 25/00](#), [F16B 35/00](#), [F16B 47/00](#) take precedence; for hanging pictures or the like [A47G 1/16](#); towing hooks for ships [B63B 21/58](#); for hoisting or hauling purposes [B66C](#); hooks or eyes with integral parts designed to facilitate quick attachment to cables or ropes at any point [F16G 11/14](#))  
**WARNING**  
Group [F16B 45/00](#) is impacted by reclassification into groups [F16B 45/002](#), [F16B 45/005](#), [F16B 45/008](#), [F16B 45/012](#) and [F16B 45/015](#).  
All groups listed in this Warning should be considered in order to perform a complete search.
- 45/002 . {Eyes}  
**WARNING**  
Group [F16B 45/002](#) is incomplete pending reclassification of documents from group [F16B 45/00](#).  
Groups [F16B 45/00](#) and [F16B 45/002](#) should be considered in order to perform a complete search.
- 45/005 . {characterised by the material}  
**WARNING**  
Groups [F16B 45/005](#), [F16B 45/008](#), [F16B 45/012](#), and [F16B 45/015](#) are incomplete pending reclassification of documents from groups [F16B 45/00](#), [F16B 45/02](#), [F16B 45/021](#) and [F16B 45/04](#).  
All groups listed in this Warning should be considered in order to perform a complete search.
- 45/008 . . {plastics}
- 45/012 . . {wire}
- 45/015 . . {sheet metal}
- 45/02 . Hooks with pivoting {or elastically bending} closing member  
**WARNING**  
Group [F16B 45/02](#) is impacted by reclassification into groups [F16B 45/005](#), [F16B 45/008](#), [F16B 45/012](#), [F16B 45/015](#), [F16B 45/021](#), [F16B 45/022](#), [F16B 45/023](#), [F16B 45/024](#), [F16B 45/026](#), [F16B 45/027](#), [F16B 45/028](#), [F16B 45/029](#), [F16B 45/031](#), [F16B 45/032](#), [F16B 45/033](#), [F16B 45/034](#), [F16B 45/035](#), [F16B 45/036](#) and [F16B 45/037](#).  
All groups listed in this Warning should be considered in order to perform a complete search.
- 45/021 . . {the closing member being operable remotely, e.g. by cables, chains or rods}  
**WARNING**  
Group [F16B 45/021](#) is incomplete pending reclassification of documents from groups [F16B 45/02](#).  
Group [F16B 45/021](#) is also impacted by reclassification into groups [F16B 45/005](#), [F16B 45/008](#), [F16B 45/012](#), [F16B 45/015](#), [F16B 45/022](#), [F16B 45/023](#), [F16B 45/024](#), [F16B 45/026](#), [F16B 45/027](#), [F16B 45/028](#), [F16B 45/029](#), [F16B 45/031](#), [F16B 45/032](#), [F16B 45/033](#), [F16B 45/034](#), [F16B 45/035](#), [F16B 45/036](#) and [F16B 45/037](#).  
All groups listed in this Warning should be considered in order to perform a complete search.
- 45/022 . . {the closing member pivoting about an axis lying in the plane of the hook}  
**WARNING**  
Group [F16B 45/022](#) is incomplete pending reclassification of documents from group [F16B 45/02](#).  
All groups listed in this Warning should be considered in order to perform a complete search.
- 45/023 . . {the closing member pivoting about an axis perpendicular to the plane of the hook}  
**WARNING**  
Group [F16B 45/023](#) is incomplete pending reclassification of documents from group [F16B 45/02](#).  
All groups listed in this Warning should be considered in order to perform a complete search.



- 45/024 . . {and having means biasing the closing member about the pivot}

**WARNING**

Groups [F16B 45/024](#) and [F16B 45/026](#) are incomplete pending reclassification of documents from group [F16B 45/02](#).

All groups listed in this Warning should be considered in order to perform a complete search.

- 45/026 . . . {and including a coil type spring}  
45/027 . . {and having position-locking means for the closing member}

**WARNING**

Groups [F16B 45/027](#), [F16B 45/028](#) and [F16B 45/029](#) are incomplete pending reclassification of documents from group [F16B 45/02](#).

All groups listed in this Warning should be considered in order to perform a complete search.

- 45/028 . . . {the position-locking means being pivotally connected}  
45/029 . . . {the position-locking means being slidably mounted}  
45/031 . . {the closing member closing when a structure to be secured is tensioned}

**WARNING**

Group [F16B 45/031](#) is incomplete pending reclassification of documents from group [F16B 45/02](#).

All groups listed in this Warning should be considered in order to perform a complete search.

- 45/032 . . {whereby the closing member is slidable relative to the pivot}

**WARNING**

Group [F16B 45/032](#) is incomplete pending reclassification of documents from group [F16B 45/02](#).

All groups listed in this Warning should be considered in order to perform a complete search.

- 45/033 . . {the closing member being revolvably mounted and having a disc shape}

**WARNING**

Group [F16B 45/033](#) is incomplete pending reclassification of documents from group [F16B 45/02](#).

All groups listed in this Warning should be considered in order to perform a complete search.

- 45/034 . . {the closing member constituting the hook shaped portion of the hook}

**WARNING**

Group [F16B 45/034](#) is incomplete pending reclassification of documents from group [F16B 45/02](#).

All groups listed in this Warning should be considered in order to perform a complete search.

- 45/035 . . {the hook forming a loop or ring when interlocked with the closing member, i.e. the entire structure of the hook being loop shaped}

**WARNING**

Group [F16B 45/035](#) is incomplete pending reclassification of documents from group [F16B 45/02](#).

All groups listed in this Warning should be considered in order to perform a complete search.

- 45/036 . . {with an elastically bending closing member}

**WARNING**

Group [F16B 45/036](#) is incomplete pending reclassification of documents from group [F16B 45/02](#).

All groups listed in this Warning should be considered in order to perform a complete search.

- 45/037 . . {Multiple locking cavities, each having a pivoting closing member}

**WARNING**

Group [F16B 45/037](#) is incomplete pending reclassification of documents from group [F16B 45/02](#).

All groups listed in this Warning should be considered in order to perform a complete search.

- 45/04 . Hooks with sliding closing member

**WARNING**

Group [F16B 45/04](#) is impacted by reclassification into groups [F16B 45/005](#), [F16B 45/008](#), [F16B 45/012](#), [F16B 45/015](#), [F16B 45/043](#), [F16B 45/045](#), [F16B 45/047](#), [F16B 45/049](#), [F16B 45/051](#), [F16B 45/053](#), [F16B 45/055](#), [F16B 45/057](#) and [F16B 45/059](#).

All groups listed in this Warning should be considered in order to perform a complete search.

- 45/043 . . {the closing member being operable remotely, e.g. by cables, chains or rods}

**WARNING**

Group [F16B 45/043](#) is incomplete pending reclassification of documents from group [F16B 45/04](#).

All groups listed in this Warning should be considered in order to perform a complete search.

- 45/045 . . {provided with position-locking means for the closing member}

**WARNING**

Groups [F16B 45/045](#) and [F16B 45/047](#) are incomplete pending reclassification of documents from group [F16B 45/04](#).

Groups [F16B 45/04](#) and [F16B 45/045](#) should be considered in order to perform a complete search.

- 45/047 . . . {in the form of a threaded closing member}

- 45/049 . . {provided with means biasing the closing member}

**WARNING**

Group [F16B 45/049](#) is incomplete pending reclassification of documents from group [F16B 45/04](#).

Groups [F16B 45/04](#) and [F16B 45/049](#) should be considered in order to perform a complete search.

- 45/051 . . {provided with a guide of the closing member encircling a shank of the hook}

**WARNING**

Group [F16B 45/051](#) is incomplete pending reclassification of documents from group [F16B 45/04](#).

Groups [F16B 45/04](#) and [F16B 45/051](#) should be considered in order to perform a complete search.

- 45/053 . . {provided with a cavity in a shank of the hook forming a track or way for the closing member}

**WARNING**

Group [F16B 45/053](#) is incomplete pending reclassification of documents from group [F16B 45/04](#).

Groups [F16B 45/04](#) and [F16B 45/053](#) should be considered in order to perform a complete search.

- 45/055 . . {the closing member constituting the hook-shaped portion of the hook}

**WARNING**

Group [F16B 45/055](#) is incomplete pending reclassification of documents from group [F16B 45/04](#).

Groups [F16B 45/04](#) and [F16B 45/055](#) should be considered in order to perform a complete search.

- 45/057 . . {the hook forming a loop or ring when interlocked with the closing member, i.e. the entire structure of the hook being loop shaped}

**WARNING**

Group [F16B 45/057](#) is incomplete pending reclassification of documents from group [F16B 45/04](#).

Groups [F16B 45/04](#) and [F16B 45/057](#) should be considered in order to perform a complete search.

- 45/059 . . {Multiple locking cavities, each having a sliding closing member}

**WARNING**

Group [F16B 45/059](#) is incomplete pending reclassification of documents from group [F16B 45/04](#).

Groups [F16B 45/04](#) and [F16B 45/059](#) should be considered in order to perform a complete search.

- 45/06 . Hooks with two symmetrically-pivoting hook parts {within the same locking cavity ([F16B 45/035](#) takes precedence)}

**47/00 Suction cups for attaching purposes; Equivalent means using adhesives** {(devices using adhesives, suction or magnetism for hanging or supporting pictures or the like [A47G 1/17](#); vacuum work holders [B25B 11/005](#); anchoring of ships using suction [B63B 21/27](#); suction cups for handling glass [B65G 49/061](#); load-engaging elements for cranes using suction means [B66C 1/02](#))}

- 47/003 . {using adhesives for attaching purposes (using adhesives for connecting constructional elements [F16B 11/006](#))}

- 47/006 . {the suction cups being activated by the rotation of a cranked lever arm}

**2200/00 Constructional details of connections not covered for in other groups of this subclass**

- 2200/10 . Details of socket shapes

- 2200/20 . Connections with hook-like parts gripping behind a blind side of an element to be connected

- 2200/205 . . the hook being a separate retainer

- 2200/30 . Dovetail-like connections

- 2200/40 . Clamping arrangements where clamping parts are received in recesses of elements to be connected

- 2200/403 . . Threaded clamping parts

- 2200/406 . . Clamping parts being collars, bushings or wedges

- 2200/50 . Flanged connections

- 2200/503 . . the flange being separate from the elements to be connected

- 2200/506 . . bolted or riveted

- 2200/509 . . clamped