

CPC**COOPERATIVE PATENT CLASSIFICATION****F16B****DEVICES FOR FASTENING OR SECURING CONSTRUCTIONAL ELEMENTS OR MACHINE PARTS TOGETHER, e.g. NAILS, BOLTS, CIRCLIPS, CLAMPS, CLIPS, WEDGES, JOINTS OR JOINTING****NOTE**

Attention is drawn to:
the Note following group [E04B 1/38](#);

the following places:

[A44B](#) Buckles, slide fasteners

[A47G 3/00](#) Ornamental heads for nails, screws, or the like

[B42F 3/00](#) Means, not using staples, for attaching sheets temporarily together

{[C14B 17/08](#) Fastening devices, e.g. clips for leather-

stretching used in apparatus or machines

for manufacturing or treating skins, hides, leathers or furs}

[E01B 9/10](#) Screws or bolts for railway sleepers

[E01B 11/00](#) Rail joints

[E04](#) Connections for building

[E04D 13/08](#) Clamping means for down pipes for roof drainage

[E04G 5/04](#) Fastening scaffolds against buildings

[E04G 7/00](#) Scaffolding couplings

[E05C](#) Bolts for fasteners for wings, specially for doors or windows

[F16C 29/10](#) Locking bearings for parts moving only linearly

[F16G 17/00](#) Hooks as integral parts of chains

[F16L](#) Pipe joints

[F16L 3/00](#) Supports for pipes, cables or protective tubing, e.g. hangers, holders, clamps, cleats, clips, brackets

[F16L 33/02](#) Clips for connecting hoses to rigid members

[H01F 7/00](#) Magnetic holding devices

[H02N 13/00](#) Electrostatic holding devices.

F16B

(continued)

Groups [F16B 2/00](#) to [F16B 47/00](#) take precedence over group [F16B 1/00](#).**WARNING**

The following IPC groups are not used in the CPC scheme. Subject matter covered by these groups is classified in the following CPC groups:

F16B 7/08	covered by	F16B 5/12 , F16B 7/04 , F16L 3/00
F16B 7/12	" "	F16B 7/105
F16B 7/16	" "	F16B 7/14
F16B 13/10	" "	F16B 13/08
F16B 13/13	" "	F16B 13/002 , F16B 13/12
F16B 21/14	" "	F16B 21/12 , F16B 21/125
F16B 25/02	" "	F16B 25/00
F16B 25/04	" "	F16B 25/00
F16B 25/06	" "	F16B 25/00
F16B 25/08	" "	F16B 25/00
F16B 33/04	" "	F16B 33/02
F16B 37/10	" "	F16B 37/0842 , F16B 37/0871

F16B 1/00

Devices for securing together, or preventing relative movement between, constructional elements or machine parts

- | | |
|--------------------------------|---|
| F16B 2001/0007 | . {Fasteners made by sintering powders } |
| F16B 1/0014 | . {by the use of a shape-memory material} |
| F16B 2001/0021 | . {Friction-reducing coatings} |
| F16B 2001/0028 | . {by the use of a material of the hooks-and-loops type} |
| F16B 2001/0035 | . {by the use of a magnetic material} |
| F16B 2001/0042 | . {by the use of an explosive charge (F16B 19/125 , F16B 31/005 take precedence)} |
| F16B 1/005 | . {by the use of a hydraulic action} |
| F16B 1/0057 | . {by the use of a pneumatic action} |
| F16B 2001/0064 | . {and establishing a good electrical connection} |
| F16B 1/0071 | . {with markings, colours, indicators or the like (for indicating tensile load F16B 31/02)} |
| F16B 2001/0078 | . {having differing thermal expansion coefficients} |
| F16B 2001/0085 | . {Ceramic-to-metal-connections} |
| F16B 2001/0092 | . {with means for avoiding incorrect assembly or positioning} |
| F16B 1/02 | . Means for securing elements of mechanisms after operation (means for bringing members to rest F16D) |
| F16B 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](#))

- F16B 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](#))}
- [F16B 2/005](#) . {Means to increase the friction-coefficient}
- [F16B 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
- [F16B 2/04](#) .. internal, i.e. with spreading action ([F16B 2/14](#) to [F16B 2/18](#) take precedence)
- [F16B 2/06](#) .. external, i.e. with contracting action ([F16B 2/14](#) to [F16B 2/18](#) take precedence)
- [F16B 2/065](#) ... {using screw-thread elements ([F16B 2/08](#) to [F16B 2/12](#) take precedence)}
- [F16B 2/08](#) ... using bands
- [F16B 2/10](#) ... using pivoting jaws
- [F16B 2/12](#) ... using sliding jaws
- [F16B 2/14](#) .. using wedges
- [F16B 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](#))}
- [F16B 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](#))}
- [F16B 2/185](#) ... {using levers}
- [F16B 2/20](#) . Clips, i.e. with gripping action effected solely by the inherent resistance to deformation of the material of the fastening
- [F16B 2/205](#) .. {with two stable positions}
- [F16B 2/22](#) .. of resilient material, e.g. rubbery material {([F16B 2/205](#) takes precedence)}
- [F16B 2/24](#) ... of metal
- [F16B 2/241](#) {of sheet metal}
- [F16B 2/243](#) {internal, i.e. with spreading action}
- [F16B 2/245](#) {external, i.e. with contracting action}
- [F16B 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}
- [F16B 2/248](#) {of wire}
- [F16B 2/26](#) .. of pliable, non-resilient material, e.g. plant tie
- F16B 3/00** **Key-type connections; Keys** ([F16B 2/00](#) takes precedence; for rods or tubes mutually [F16B 7/00](#))
- [F16B 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](#))}
- [F16B 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
- [F16B 3/06](#) . using taper sleeves

F16B 4/00	Shrinkage connections, e.g. assembled with the part 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})
F16B 4/002	. {engaging or disengaging by means of fluid pressure}
F16B 4/004	. {Press fits, force fits, interference fits, i.e. fits without heat or chemical treatment (F16B 4/002 takes precedence)}
F16B 4/006	. {Shrinkage connections, e.g. assembled with the parts being at different temperature}
F16B 4/008	.. {using heat-recoverable, i.e. shrinkable, sleeves}
F16B 5/00	Joining sheets or plates, {e.g. panels}, to one another or to strips or bars parallel to them ({F16B 17/002 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)
F16B 5/0004	. {Joining sheets, plates or panels in abutting relationship (F16B 5/01 takes precedence)}
F16B 5/0008	.. {by moving the sheets, plates or panels substantially in their own plane, perpendicular to the abutting edge}
F16B 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}
F16B 5/0016	.... {with snap action}
F16B 5/002	... {both sheets, plates or panels having a groove, e.g. with strip-type connector}
F16B 5/0024	... {the sheets, plates or panels having holes, e.g. for dowel- type connections}
F16B 5/0028	... {using I-shaped connectors (with flanges moving towards each other F16B 5/0068)}
F16B 5/0032	.. {by moving the sheets, plates, or panels or the interlocking key parallel to the abutting edge}
F16B 5/0036	... {and using hook and slot or keyhole-type connections}
F16B 5/004	... {and using C-shaped clamps}
F16B 5/0044	... {and using interlocking keys of circular, square, rectangular or like shape}
F16B 5/0048	.... {hinge-like}
F16B 5/0052	... {the interlocking key acting as a dovetail-type key}
F16B 5/0056	.. {by moving the sheets, plates or panels or the interlocking key perpendicular to the main plane}
F16B 5/006	... {and using ring-shaped clamps}
F16B 5/0064	... {and using C-shaped clamps}
F16B 5/0068	... {and using I-shaped clamps with flanges moving towards each other}
F16B 5/0072	.... {and using screw-thread}
F16B 5/0076	... {and using expanding clamps}
F16B 5/008	.. {by a rotating or sliding and rotating movement}
F16B 5/0084	.. {characterised by particular locking means (not used, see subgroups)}

- F16B 5/0088 . . . {with locking means moving substantially perpendicular to the main plane, e.g. pins, screws}
- F16B 5/0092 . . . {with locking means rotating about an axis parallel to the main plane and perpendicular to the abutting edge, e.g. screw, bayonet}
- F16B 5/0096 . {by using permanent deformation}
- F16B 5/01 . by means of fastening elements specially adapted for honeycomb panels
- F16B 5/02 . by means of fastening members using screw-thread ({F16B 5/0004 takes precedence}; construction of screw-threaded connections F16B 25/00 to F16B 39/00)
- F16B 5/0208 . . {using panel fasteners, i.e. permanent attachments allowing for quick assembly}
- F16B 5/0216 . . {the position of the plates to be connected being adjustable}
- F16B 5/0225 . . . {allowing for adjustment parallel to the plane of the plates}
- F16B 5/0233 . . . {allowing for adjustment perpendicular to the plane of the plates}
- F16B 5/0241 . . {with the possibility for the connection to absorb deformation, e.g. thermal or vibrational}
- F16B 5/025 . . {specially designed to compensate for misalignment or to eliminate unwanted play}
- F16B 5/0258 . . {using resiliently deformable sleeves, grommets or inserts (F16B 43/001 takes precedence)}
- F16B 5/0266 . . {using springs}
- F16B 5/0275 . . {the screw-threaded element having at least two axially separated threaded portions (F16B 5/0283 takes precedence)}
- F16B 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}
- F16B 5/0291 . . {the threaded element being driven through the edge of a sheet plate with its axis in the plane of the plate}
- F16B 5/04 . by means of riveting (rivets F16B 19/04)
- F16B 5/045 . . {without the use of separate rivets}
- F16B 5/06 . by means of clamps or clips ({F16B 5/0004 takes precedence}; friction-grip releasable fastenings in general F16B 2/00)
- F16B 5/0607 . . {joining sheets or plates to each other (F16B 5/0692, F16B 21/082 take precedence)}
- F16B 5/0614 . . . {in angled relationship}
- F16B 5/0621 . . . {in parallel relationship (fastened by a drive-pin F16B 19/1081; fastened by a device locking by rotation F16B 21/02)}
- F16B 5/0628 {allowing for adjustment parallel or perpendicular to the plane of the sheets or plates}
- F16B 5/0635 {fastened over the edges of the sheets or plates}
- F16B 5/0642 {the plates being arranged one on top of the other and in full close contact with each other}
- F16B 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}
- F16B 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}

- F16B 5/0664 {at least one of the sheets or plates having integrally formed or integrally connected snap-in-features}
- F16B 2005/0671 {with unlocking by rotation }
- F16B 2005/0678 . . . {in abutting relationship}
- F16B 5/0685 . . {Joining sheets or plates to strips or bars ([F16B 5/0692](#) takes precedence)}
- F16B 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](#))}
- F16B 5/07 . by means of multiple interengaging protrusions on the surfaces, e.g. hooks, coils,
- F16B 5/08 . by means of welds or the like ([welding B23K](#))
- F16B 5/10 . by means of bayonet connections ({[F16B 5/0092](#) takes precedence}; fastening devices locking by rotation [F16B 21/02](#))
- F16B 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](#))
- F16B 5/121 . . {fastened over the edge(s) of the sheet(s) or plate(s)}
- F16B 5/123 . . {Auxiliary fasteners specially designed for this purpose}
- F16B 5/125 . . . {one of the auxiliary fasteners is comprising wire or sheet material or is made thereof}
- F16B 5/126 . . {at least one of the sheets, plates, bars or strips having integrally formed or integrally connected snap-in-features}
- F16B 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}

- F16B 7/00** **Connections of rods or tubes, e.g. of non-circular section, mutually, including resilient connections** ({[F16B 11/008](#), [F16B 17/002](#) 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](#))
- F16B 7/02 . with conical parts
- F16B 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](#))}
- F16B 7/04 . Clamping or clipping connections (friction-grip releasable fastenings in general [F16B 2/00](#))
- F16B 7/0406 . . {for rods or tubes being coaxial ([F16B 7/10](#) takes precedence)}
- F16B 7/0413 . . . {for tubes using the innerside thereof ([F16B 7/025](#) takes precedence)}
- F16B 7/042 {with a locking element, e.g. pin, ball or pushbutton, engaging in a hole in the wall of at least one tube}
- F16B 7/0426 . . . {for rods or for tubes without using the innerside thereof}
- F16B 7/0433 . . {for rods or tubes being in parallel relationship}
- F16B 7/044 . . {for rods or tubes being in angled relationship}
- F16B 7/0446 . . . {for tubes using the innerside thereof ([F16B 7/025](#) takes precedence)}

- F16B 7/0453 {the tubes being drawn towards each other ([F16B 7/0473](#) takes precedence)}
- F16B 7/046 {by rotating an eccentric-mechanism}
- F16B 7/0466 {by a screw-threaded stud with a conical tip acting on an inclined surface}
- F16B 7/0473 {with hook-like parts gripping, e.g. by expanding, behind the flanges of a profile}
- F16B 7/048 {for rods or for tubes without using the innerside thereof}
- F16B 7/0486 {forming an abutting connection of at least one tube}
- F16B 7/0493 {forming a crossed-over connection}
- F16B 7/06 . . Turnbuckles ([for cables, ropes, or wire F16G 11/12](#))
- F16B 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](#) to [E21D 15/46](#); stands or trestles as supports for apparatus or articles placed thereon { [F16M 11/26](#)}
- F16B 7/105 . . {locking in discrete positions, e.g. in extreme extended position}
- F16B 7/14 . . locking in intermediate {non-discrete} positions {(the rod or tube being locked by a tilting clip [F16B 2/246](#))}
- F16B 7/1409 . . . {with balls or rollers urged by an axial displacement of a wedge or a conical member}
- F16B 7/1418 . . . {with a clamping collar or two split clamping rings tightened by a screw or a cammed latch member}
- F16B 7/1427 . . . {with cammed or eccentric surfaces co-operating by relative rotation of the telescoping members or by rotation of an external collar}
- F16B 7/1436 {with rollers or balls}
- F16B 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)}
- F16B 7/1454 . . . {with a clamp locking the telescoping members by swinging a handle provided with a locking cam ([F16B 7/1418](#) takes precedence)}
- F16B 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}
- F16B 7/1472 . . . {with a clamping screw perpendicular to the axis of the telescoping members}
- F16B 7/1481 . . . {with a gripping helical spring}
- F16B 7/149 . . . {with a sleeve or ring having a tapered or conical surface ([F16B 7/1463](#) takes precedence)}
- F16B 2007/16 . . . {locking only against movement in one direction}
- F16B 7/18 . . using screw-thread elements {([F16B 7/025](#) takes precedence; for turnbuckles [F16B 7/06](#))}
- F16B 7/182 . . {for coaxial connections of two rods or tubes}
- F16B 7/185 . . {with a node element}
- F16B 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](#))}
- F16B 7/20 . . using bayonet connections
- F16B 7/22 . . using hooks or like elements

F16B 9/00	Connections of rods or tubular parts to flat surfaces at an angle (F16B 17/002 takes precedence); 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 to walls F16L 41/00)
F16B 9/02	. Detachable connections
F16B 9/023	.. {using clamps or clips}
F16B 9/026	.. {using screw-thread elements}
F16B 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)
F16B 11/002	. {by pressing the elements together so as to obtain plastic deformation (shrinkage connections, force fits F16B 4/00 ; pin-and-hole connections F16B 17/00)}
F16B 11/004	. {by cold pressure welding}
F16B 11/006	. {by gluing (gluing of plastics material B29C 65/48)}
F16B 11/008	.. {of tubular elements or rods in coaxial engagement}
F16B 12/00	Jointing of furniture or the like, e.g. hidden from exterior (F16B 2/00 to F16B 11/00 take precedence; fastening means per se F16B 13/00 to F16B 47/00 ; wood-working B27)
F16B 12/02	. Joints between panels and corner posts
F16B 12/04	. Non-loosenable joints for non-metal furniture parts, e.g. glued
F16B 2012/043	.. {using carpentry joints other than mortise and tenon joints, e.g. using multiple tenons }
F16B 2012/046	.. {using mortise and tenon joints }
F16B 12/06	. Non-loosenable joints for metal furniture parts
F16B 12/08	.. without use of separate connecting elements
F16B 12/10	. using pegs, bolts, tenons, clamps, clips, or the like (glued F16B 12/04 ; fastening means per se F16B 15/00 to F16B 47/00)
F16B 2012/103	.. {Sleeves or dowels for connection fittings }
F16B 2012/106	.. {Connection bolts for connection fittings }
F16B 12/12	.. for non-metal furniture parts, e.g. made of wood, of plastics
F16B 12/125	... {using mortise and tenon joints}
F16B 12/14	... using threaded bolts or screws
F16B 2012/145	.... {Corner connections }
F16B 12/16	.... using self-tapping screws
F16B 12/18	.... using drawing bars
F16B 12/20	... using clamps, clips, wedges, sliding bolts, or the like
F16B 12/2009	.... {actuated by rotary motion}
F16B 2012/2018	..... {pin and drum securing device; drum has cam surface to engage the head of the pin}
F16B 12/2027	..... {with rotating excenters or wedges}

F16B 12/2036	.....	{with rotating excenters or wedges acting on a head of a pin or screw}
F16B 2012/2045	.....	{pin and drum securing device; drum has screw to engage the head of the pin}
F16B 12/2054	.....	{with engaging screw threads as securing means for limiting movement}
F16B 12/2063	.....	{with engaging screw threads as tightening means}
F16B 2012/2072	.....	{Pin and drum securing devices; Drums having lever with cam surface to engage the head of the pin }
F16B 2012/2081	.....	{having a fitting providing slanted access for a screwdriver as actuator }
F16B 2012/209	.....	{having an integrated lever as actuator }
F16B 12/22	...	using keyhole-shaped slots and pins
F16B 12/24	...	using separate pins, dowels, or the like
F16B 12/26	...	using snap-action elements
F16B 12/28	..	for metal furniture parts
F16B 12/30	...	using threaded bolts
F16B 12/32	...	using clamps, clips, wedges, sliding bolts, or the like
F16B 12/34	...	using keyhole-shaped slots and pins
F16B 12/36	...	using separate pins, dowels or the like
F16B 12/38	...	using snap-action elements
F16B 12/40	.	Joints for furniture tubing
F16B 2012/403	..	{with inserts for joining tubes coaxially }
F16B 2012/406	..	{Cove joints for joining two cylindrical members }
F16B 12/42	..	connecting furniture tubing to non-tubular parts {(connecting table tops to underframes A47B 13/003)}
F16B 12/44	.	Leg joints; Corner joints
F16B 2012/443	..	{with two-dimensional corner element, the legs thereof being inserted in hollow frame members }
F16B 2012/446	..	{with three-dimensional corner element, the legs thereof being inserted in hollow frame members }
F16B 12/46	..	Non-metal corner connections
F16B 2012/463	...	{for wooden members without additional elements }
F16B 2012/466	...	{using mortise and tenon joints }
F16B 12/48	..	Non-metal leg connections (F16B 12/46 takes precedence)
F16B 12/50	..	Metal corner connections
F16B 2012/505	...	{having a corner insert which is inserted in mitered profiled members }
F16B 12/52	..	Metal leg connections (F16B 12/50 takes precedence)
F16B 12/54	.	Fittings for bedsteads or the like
F16B 12/56	..	Brackets for bedsteads; Coupling joints consisting of bolts or the like; Latches therefor
F16B 12/58	..	Tapered connectors for bed rails
F16B 12/60	..	Fittings for detachable side panels

F16B 13/00

Dowels or other devices fastened in walls or the like by inserting them in holes made therein for that purpose (nails [F16B 15/00](#); self-locking pins or bolts in general, stud-and-socket releasable fastenings [F16B 21/00](#); dowels or bolts for railroad sleepers [E01B 9/00](#); ans means for anchoring structural elements or bulkheads specially adapted to foundation engineering [E02D 5/74](#); bolts or dowels used while laying bricks or casting concrete sleepers [E04B 1/38](#); setting anchoring bolts in shafts, tunnels or galleries [E21D 20/00](#); anchoring bolts for shafts, tunnels or galleries [E21D 21/00](#))

- F16B 13/001 . {with means for preventing rotation of the dowel}
- F16B 13/002 . {self-cutting}
- F16B 13/003 . . {with a separate drilling bit attached to or surrounded by the dowel element}
- F16B 13/004 . . {with a drilling sleeve driven against a tapered or spherical plug}
- F16B 13/005 . {formed in integral series but easily separable}
- F16B 2013/006 . {with sealing means }
- F16B 2013/007 . {to be fastened in undercut holes}
- F16B 2013/008 . {used for mining purposes}
- F16B 2013/009 . {Double sleeve dowels, i.e. the frist 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 }
- F16B 13/02 . in one piece with protrusion or ridges on the shaft
- F16B 13/025 . . {of rolled sheet material}
- F16B 13/04 . with parts gripping in the hole or behind the reverse side of the wall after inserting from the front ({[F16B 13/002](#) and [F16B 13/12](#) take precedence;} friction-grip releasable fastenings in general [F16B 2/00](#))
- F16B 13/045 . . {having axially compressing parts allowing the clamping of an object tightly to the wall}
- F16B 13/06 . . combined with expanding sleeve ({[F16B 13/045](#) and [F16B 13/08](#) take precedence})
- F16B 13/061 . . . {of the buckling type}
- F16B 13/063 . . . {by the use of an expander}
- F16B 13/065 {fastened by extracting the screw, nail or the like}
- F16B 13/066 {fastened by extracting a separate expander-part, actuated by the screw, nail or the like}
- F16B 13/068 {expanded in two or more places}
- F16B 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
- F16B 13/0808 . . . {by a toggle-mechanism}
- F16B 13/0816 . . . {with a wedging drive-pin}
- F16B 13/0825 . . . {with a locking element, e.g. sleeve, ring or key co-operating with a cammed or eccentric surface of the dowel body}
- F16B 13/0833 . . . {with segments or fingers expanding or tilting into an undercut hole ([F16B 13/0858](#) takes precedence)}
- F16B 13/0841 . . . {with a deformable sleeve member driven against the abutting surface of the head of the bolt or of a plug}
- F16B 13/085 . . . {with a drive-nail deflected by an inclined surface in the dowel body (nails with spreading shaft [F16B 15/04](#))}

- F16B 13/0858 ... {with an expansible sleeve or dowel body driven against a tapered or spherical expander plug ([F16B 13/004](#) takes precedence)}
- F16B 13/0866 ... {with prongs penetrating into the wall of the hole by a retractile movement of a threaded member}
- F16B 13/0875 ... {with elastic discs or spring washers anchoring in the hole}
- F16B 13/0883 ... {with split rings or wire between the threads of the dowel body or in grooves near a conical surface ([F16B 13/0825](#) takes precedence)}
- F16B 13/0891 ... {with a locking element, e.g. wedge, key or ball moving along an inclined surface of the dowel body ([F16B 13/0816](#), [F16B 13/0825](#), [F16B 13/0883](#) take precedence)}
- F16B 2013/10 .. {with gripping parts moved into their final position in relation to the body of the device by a separate operation}
- F16B 2013/105 ... {with a toggle-mechanism}
- F16B 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)}
- F16B 13/122 .. {made from a sheet-metal blank}
- F16B 13/124 .. {fastened by inserting a threaded element, e.g. screw or bolt ([F16B 13/122](#), [F16B 13/128](#) take precedence)}
- F16B 13/126 .. {fastened by inserting an unthreaded element, e.g. pin or nail ([F16B 13/122](#), [F16B 13/128](#) take precedence)}
- F16B 13/128 .. {with extending protrusions, e.g. discs, segments, ridges, fingers or tongues ([F16B 13/122](#) takes precedence)}
- F16B 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
- F16B 13/141 .. {Fixing plugs in holes by the use of settable material}
- F16B 13/142 ... {characterised by the composition of the setting material or mixture ([F16B 13/143](#) takes precedence)}
- F16B 13/143 ... {using frangible cartridges or capsules containing the setting components}
- F16B 13/144 {characterised by the shape or configuration or material of the frangible cartridges or capsules}
- F16B 13/145 {characterised by the composition of the setting agents contained in the frangible cartridges or capsules}
- F16B 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}
- F16B 2013/147 ... {Grout with reinforcing elements or with fillers, e.g. fibres, flakes, balls, wires}
- F16B 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](#))

- F16B 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](#))
- F16B 15/0007 . {with two nail points extending in opposite directions, in order to fix two workpieces together}

- F16B 15/0015 . {Staples}
- F16B 15/0023 . {Nail plates (claw dowels for building structures [E04B 1/49](#); machines for driving in nail plates [B27F 7/15](#))}
- F16B 15/003 .. {with teeth cut out from the material of the plate}
- F16B 15/0038 ... {only on the perimeter of the plate}
- F16B 15/0046 ... {from the body of the plate}
- F16B 15/0053 .. {with separate nails attached to the plate}
- F16B 2015/0061 .. {Multipiece-plates}
- F16B 2015/0069 .. {with nails on both sides}
- F16B 2015/0076 .. {with provisions for additional fastening means, e.g. hooks, holes for separate screws or nails, adhesive}
- F16B 2015/0084 .. {with marks to indicate where to strike with the hammer}
- F16B 15/0092 . {Coated nails or staples}
- F16B 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](#))
- F16B 15/04 . with spreading shaft {(dowels with a drive-nail deflected by an inclined surface in the dowel body [F16B 13/085](#))}
- F16B 15/06 . with barbs, e.g. for metal parts; Drive screws
- F16B 15/08 . formed in integral series but easily separable

- F16B 17/00** **Connecting constructional elements or machine parts by a part of or on one member entering a hole in the other** (construction of pins, bolts or rivets [F16B 19/00](#); riveting [F16B 19/04](#); means for preventing withdrawal of a pin, spigot or the like from its operative position, stud-and-socket releasable fastenings [F16B 21/00](#))
- F16B 17/002 . {Non-releasable connections, i.e. by means of plastic deformation}
- F16B 17/004 .. {of rods or tubes mutually}
- F16B 17/006 .. {of rods or tubes to sheets or plates}
- F16B 17/008 .. {of sheets or plates mutually}

- F16B 19/00** **Bolts without screw-thread; Pins, including deformable elements** (in screwed connections [F16B 29/00](#)); **Rivets** (means for preventing withdrawal [F16B 21/00](#))
- F16B 19/002 . {Resiliently deformable pins ([F16B 21/06](#) takes precedence)}
- F16B 19/004 .. {made in one piece ([F16B 21/084](#) takes precedence)}
- F16B 2019/006 .. {made in a plurality of pieces}
- F16B 19/008 . {with sealing means}
- F16B 19/02 . Bolts or sleeves for positioning of machine parts, e.g. notched taper pins, fitting pins, sleeves, eccentric positioning rings
- F16B 19/04 . Rivets; Spigots or the like fastened by riveting (lead seals [G09F 3/00](#))
- F16B 2019/045 .. {Coated rivets}
- F16B 19/05 .. Bolts fastening by swaged-on collars ([F16B 19/08](#) takes precedence)
- F16B 2019/055 ... {deformed by an electro-magnetic action}
- F16B 19/06 .. Solid rivets made in one piece
- F16B 19/08 .. Hollow rivets; Multi-part rivets

F16B 19/083	...	{Self-drilling rivets}
F16B 19/086	...	{Self-piercing rivets}
F16B 19/10	...	fastened by expanding mechanically

NOTE

Subject matter relating to hollow or single-part rivets fastened by a pull-through mandrel is classified in [F16B 19/1045](#)

Subject matter relating to hollow or single-part rivets fastened by a drive pin is classified in [F16B 19/1081](#)

F16B 2019/1009	....	{hollow or single-part rivets fastened by a pull-through mandrel}
F16B 2019/1018	....	{hollow or single-part rivets fastened by a drive pin}
F16B 19/1027	....	{Multi-part rivets}
F16B 19/1036	.....	{Blind rivets}
F16B 19/1045	.....	{fastened by a pull - mandrel or the like (F16B 19/109 takes precedence)}
F16B 19/1054	.....	{the pull-mandrel or the like being frangible}
F16B 19/1063	.....	{with a sleeve or collar sliding over the hollow rivet body during the pulling operation}
F16B 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)}
F16B 19/1081	.....	{fastened by a drive-pin (F16B 19/109 takes precedence)}
F16B 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)}
F16B 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)
F16B 19/125	....	{fastened by explosion}
F16B 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)

F16B 21/00 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**

F16B 21/02	.	Releasable fastening devices locking by rotation (with snap-action F16B 21/06 ; studs or coupling pins with resilient protrusions F16B 21/08)
F16B 21/04	..	with bayonet catch
F16B 21/06	.	Releasable fastening devices with snap-action ({ quickly-detachable or mountable nuts to threaded bolts F16B 37/0842 })
F16B 21/065	..	{with an additional locking element}
F16B 21/07	..	in which the socket has a resilient part ({ F16B 21/065 takes precedence})

F16B 21/071	...	{the socket being integrally formed with a component to be fastened, e.g. a sheet, plate or strip}
F16B 21/073	...	{the socket having a resilient part on its inside}
F16B 21/075	....	{the socket having resilient parts on its inside and outside}
F16B 21/076	...	{the socket having a resilient part on its outside (F16B 21/075 takes precedence)}
F16B 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)}
F16B 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)
F16B 21/082	...	{the stud, pin or spigot having two resilient parts on its opposite ends in order to connect two elements}
F16B 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}
F16B 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}
F16B 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}
F16B 21/09	.	Releasable fastening devices with a stud engaging a keyhole slot
F16B 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)
F16B 21/12	..	with locking-pins or split-pins thrust into holes
F16B 21/125	...	{radially resilient or with a snap-action member, e.g. elastic tooth, pawl with spring, resilient coil or wire}
F16B 2021/14	...	{Details of locking-pins or split-pins}
F16B 21/16	..	with grooves or notches in the pin or shaft
F16B 21/165	...	{with balls or rollers (for connections of rods or tubes engaged telescopically F16B 7/1409)}
F16B 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)
F16B 21/183	....	{internal, i.e. with spreading action}
F16B 21/186	....	{external, i.e. with contracting action}
F16B 21/20	..	for bolts or shafts without holes, grooves, or notches for locking members ({by rings resilient in their plane F16B 21/18)}
F16B 21/205	...	{the connecting means having gripping edges in the form of a helix}

Fastening means using screw-thread (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](#))

F16B 23/00 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](#))}

- F16B 23/0007 . {characterised by the shape of the recess or the protrusion engaging the tool ([F16B 23/0069](#) and [F16B 23/0076](#) take precedence)}
- F16B 23/0015 . . {substantially rectangular, e.g. one-slot head}
- F16B 23/0023 . . {substantially cross-shaped}
- F16B 23/003 . . {star-shaped or multi-lobular, e.g. Torx-type, twelve-point star}
- F16B 23/0038 . . {substantially prismatic with up to six edges, e.g. triangular, square, pentagonal, Allen-type cross-sections}
- F16B 23/0046 . . {having one eccentric circular or polygonal recess or protrusion}
- F16B 23/0053 . {with a conical or prismatic recess for receiving a centering pin of the tool apparatus}
- F16B 23/0061 . {with grooves, notches or splines on the external peripheral surface designed for tools engaging in radial direction ([F16B 23/003](#) takes precedence)}
- F16B 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}
- F16B 23/0076 . {causing slipping of the tool in loosening rotation, i.e. disabling unscrewing unless another tool is used ([F16B 31/027](#) takes precedence)}
- F16B 23/0084 . {with a threaded engagement between the head of the bolt or screw and the tool}
- F16B 23/0092 . {with a head engageable by two or more different tools ([F16B 23/0076](#) takes precedence)}

F16B 25/00

Screws that cut thread in the body into which they are screwed, e.g. wood screws {([F16B 35/065](#) takes precedence; joining sheets or plates using screws with two separate threads [F16B 5/0275](#), using screws with adjustment sleeves [F16B 5/0283](#))}

- F16B 25/0005 . {of the helical wire type ([Threaded wire-inserts F16B 37/12](#))}
- F16B 25/001 . {characterised by the material of the body into which the screw is screwed}
- F16B 25/0015 . . {the material being a soft organic material, e.g. wood or plastic ([F16B 25/0031](#) takes precedence)}
- F16B 25/0021 . . {the material being metal, e.g. sheet-metal or aluminium ([F16B 25/0031](#) takes precedence)}
- F16B 25/0026 . . {the material being a hard non-organic material, e.g. stone, concrete or drywall ([F16B 25/0031](#) takes precedence)}
- F16B 25/0031 . . {the screw being designed to be screwed into different materials, e.g. a layered structure or through metallic and wooden parts}
- F16B 25/0036 . {characterised by geometric details of the screw}
- F16B 25/0042 . . {characterised by the geometry of the thread, the thread being a ridge wrapped around the shaft of the screw}
- F16B 25/0047 . . . {the ridge being characterised by its cross-section in the plane of the shaft axis}
- F16B 25/0052 . . . {the ridge having indentations, notches or the like in order to improve the cutting behaviour}
- F16B 25/0057 . . . {the screw having distinct axial zones, e.g. multiple axial thread sections with different pitch or thread cross-sections}
- F16B 25/0063 {with a non-threaded portion on the shaft of the screw}
- F16B 25/0068 . . . {with multiple-threads, e.g. a double thread screws}
- F16B 25/0073 . . . {characterised by its pitch, e.g. a varying pitch}

F16B 25/0078	.. {with a shaft of non-circular cross-section or other special geometric features of the shaft}
F16B 25/0084	.. {characterised by geometric details of the tip}
F16B 25/0089	.. {the screw having wings}
F16B 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}
F16B 25/10	. Screws performing an additional function to thread-forming, e.g. drill screws {or self-piercing screws}
F16B 25/103	.. {by means of a drilling screw-point, i.e. with a cutting and material removing action}
F16B 25/106	.. {by means of a self-piercing screw-point, i.e. without removing material}
F16B 27/00	Bolts, screws, or nuts formed in integral series but easily separable, particularly for use in automatic machines {(Arrangements for feeding screws or nuts in spanners, wrenches or screw-drivers with built-in magazines B25B 23/06)}
F16B 29/00	Screwed connection with deformation of nut or auxiliary member while fastening ({Nuts fastened to surfaces by riveting F16B 37/065 ; members deformed for locking screws, bolts or nuts F16B 39/22)}
F16B 31/00	Screwed connections specially modified in view of tensile load; Break-bolts (shape of thread { F16B 33/02 ; in couplings F16D 9/00)}
F16B 2031/002	. {Breakbolts loosening due to an electromagnetic action}
F16B 31/005	. {Breakbolts loosening due to the action of an explosive charge}
F16B 31/007	. {Break-bolts loosening at high temperature}
F16B 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 G01L 5/24)}
F16B 31/021	.. {by means of a frangible part (F16B 31/025 , F16B 31/028 take precedence; break members in torque limiters or torque indicators in wrenches or screwdrivers B25B 23/1415)}
F16B 2031/022	.. {using an ultrasonic transducer }
F16B 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}
F16B 31/025	.. {with a gauge pin in a longitudinal bore in the body of the bolt}
F16B 31/027	.. {with a bolt head causing the fastening or the unfastening tool to lose the grip when a specified torque is exceeded}
F16B 31/028	.. {with a load-indicating washer or washer assembly}
F16B 31/04	. for maintaining {a} tensile load
F16B 31/043	.. {Prestressed connections tensioned by means of liquid, grease, rubber, explosive charge, or the like (hydraulic bolt tensioners B25B 29/02)}
F16B 2031/046	... {by means of an explosive charge}
F16B 31/06	. having regard to possibility of fatigue rupture
F16B 33/00	Features common to bolt and nut

- F16B 33/002 . {Means for preventing rotation of screw-threaded elements ([F16B 39/00](#) takes precedence)}
- F16B 33/004 . {Sealing; Insulation (by means of washers [F16B 43/001](#))}
- F16B 33/006 . {Non-metallic fasteners using screw-thread}
- F16B 33/008 . {Corrosion preventing means}
- F16B 33/02 . Shape of thread; Special thread-forms ({[F16B 25/00](#) takes precedence; used to remove paint or dirt layers [F16B 35/007](#), [F16B 37/002](#)}; used as screw-locking device [F16B 39/30](#))
- F16B 2033/025 . . {with left-hand thread }
- F16B 2033/04 . . {in view of tensile load}
- F16B 33/06 . Surface treatment of parts furnished with screw-thread, e.g. for preventing seizure {or fretting (corrosion preventing means [F16B 33/008](#); settable coatings for locking threaded members [F16B 39/225](#); deformable coatings for locking threaded members [F16B 39/34](#))}

F16B 35/00**Screw-bolts; Stay-bolts; Screw-threaded studs; Screws; Set screws**

([F16B 33/008](#) takes precedence; joining sheets or plates using screws with two separate threads [F16B 5/0275](#); using screws with adjustment sleeves [F16B 5/0283](#); thread cutting screws [F16B 25/00](#))

NOTE

The fastening of heads of screws or heads of bolts to surfaces is classified in [F16B 37/04](#)

- F16B 35/002 . {onto which threads are cut during screwing ([F16B 37/002](#) takes precedence)}
- F16B 35/005 . {Set screws; Locking means therefor}
- F16B 35/007 . {Removing paint or dirt layers covering the threaded part of nut-like members}
- F16B 35/02 . divided longitudinally
- F16B 35/04 . 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 [F16B 39/00](#))
- F16B 35/041 . . {Specially-shaped shafts (shape of thread [F16B 33/02](#))}
- F16B 35/042 . . . {for retention or rotation by a tool, e.g. of polygonal cross-section}
- F16B 35/044 . . . {Specially-shaped ends}
- F16B 35/045 {for retention or rotation by a tool (specially shaped heads of bolts or screws for rotation by a tool [F16B 23/00](#))}
- F16B 35/047 {for preventing cross-threading, i.e. preventing skewing of bolt and nut}
- F16B 35/048 . . . {Specially-shaped necks ([F16B 35/06](#) takes precedence)}
- F16B 35/06 . . Specially-shaped heads (special shape in order to rotate the bolt [F16B 23/00](#)) {(separate hook adaptors for bolts [F16B 43/025](#))}
- F16B 35/065 . . . {with self-countersink-cutting means}

F16B 37/00**Nuts or like thread-engaging members {(specially shaped for rotations by a tool [F16B 23/00](#))}**

- F16B 37/002 . {cutting threads during screwing; removing paint or dirt layers covering threaded shanks}
- F16B 37/005 . {into which threads are cut during screwing}

- F16B 2037/007 . {with a blind hole }
- F16B 37/02 . made of thin sheet material (fastening to surfaces [F16B 37/04](#); {used as lock-nuts [F16B 39/14](#)})
- F16B 37/04 . Devices for fastening nuts to surfaces, e.g. sheets, plates {(nuts fastened behind a wall by a toggle-mechanism [F16B 13/0808](#); threaded inserts [F16B 37/122](#); measures against loss of bolts, nuts or pins [F16B 41/002](#))}
- F16B 37/041 .. {Releasable devices ([F16B 37/044](#), [F16B 37/045](#) take precedence)}
- F16B 37/042 ... {locking by rotation}
- F16B 37/043 ... {with snap action}
- F16B 37/044 .. {Nut cages}
- F16B 37/045 .. {specially adapted for fastening in channels, e.g. sliding bolts, channel nuts}
- F16B 37/046 ... {with resilient means for urging the nut inside the channel}
- F16B 37/047 ... {Barrel nuts}
- F16B 37/048 .. {Non-releasable devices ([F16B 37/044](#), [F16B 37/045](#) and [F16B 37/06](#) take precedence)}
- F16B 37/06 .. by means of welding or riveting
- F16B 37/061 ... {by means of welding}
- F16B 37/062 ... {by means of riveting}
- F16B 37/064 {with the use of separate rivets}
- F16B 37/065 {by deforming the material of the nut}
- F16B 37/067 {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}
- F16B 37/068 {by deforming the material of the support, e.g. the sheet or plate}
- F16B 37/08 . Quickly-detachable {or mountable} nuts, e.g. consisting of two or more parts; Nuts movable along the bolt after tilting the nut {not used, see subgroups}
- F16B 37/0807 .. {Nuts engaged from the end of the bolt, e.g. axially slidable nuts}
- F16B 37/0814 ... {movable along the bolt after tilting the nut}
- F16B 37/0821 ... {in two halves pivotally connected}
- F16B 37/0828 ... {with a longitudinal slit through the annular wall of the nut for enabling expansion of the nut, e.g. for easy removal}
- F16B 37/0835 ... {with balls engaging threads or grooves on the shaft of the bolt}
- F16B 37/0842 ... {fastened to the threaded bolt with snap-on-action, e.g. push-on nuts for stud bolts ([F16B 37/0857](#) takes precedence; snap-on-action of a pin, spigot, shaft or the like and a member surrounding it [F16B 21/06](#))}
- F16B 37/085 ... {with at least one unthreaded portion in both the nut and the bolt}
- F16B 37/0857 ... {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 ([F16B 37/0821](#) and [F16B 37/0835](#) take precedence)}
- F16B 37/0864 ... {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 ([F16B 37/0835](#) takes precedence)}
- F16B 37/0871 .. {engaging the bolt laterally, i.e. without the need to engage the end of the bolt}
- F16B 37/0878 ... {in one piece, e.g. C-shaped nuts}
- F16B 37/0885 ... {in two halves hingedly connected}

- F16B 37/0892 . . . {in two or more pieces, e.g. assemblies made by two C-shaped nuts mutually interlocked, or retained by an additional member ([F16B 37/0885](#) takes precedence)}
- F16B 37/12 . 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 [B25B 27/143](#)}
- F16B 37/122 . . {Threaded inserts, e.g. "rampa bolts"}
- F16B 37/125 . . . {the external surface of the insert being threaded}
- F16B 37/127 {and self-tapping}
- F16B 37/14 . Cap nuts; Nut caps or bolt caps
- F16B 37/145 . . {Sleeve nuts, e.g. combined with bolts}
- F16B 37/16 . Wing-nuts ([F16B 37/14](#) takes precedence)

F16B 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.

- F16B 39/01 . specially adapted to prevent loosening at extreme temperatures
- F16B 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](#))
- F16B 39/021 . . {by injecting a settable material after the screwing down}
- F16B 39/023 . . {by driving a conic or wedge-shaped expander through the threaded element}
- F16B 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)}
- F16B 39/026 . . {by swaging the nut on the bolt, i.e. by plastically deforming the nut}
- F16B 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}
- F16B 39/04 . . with a member penetrating the screw-threaded surface of at least one part, e.g. a pin, a wedge, cotter-pin, screw
- F16B 39/06 . . . with a pin or staple parallel to the bolt axis
- F16B 39/08 . . with a cap interacting with the nut, connected to the bolt by a pin or cotter pin
- F16B 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)
- F16B 39/101 . . . {with a plate, spring, wire or ring holding two or more nuts or bolt heads which are mainly in the same plane}
- F16B 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}

- F16B 39/105 {locking the bold head or nut into a hole or cavity, e.g. with the cup washer, ring or sleeve deformed into a dimple in the cavity}
- F16B 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}
- F16B 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)}
- F16B 39/12 . . by means of locknuts
- F16B 39/122 . . . {foreseen with mating surfaces inclined, i.e. not normal, to the bolt axis}
- F16B 39/124 {with helically inclined mating surfaces}
- F16B 39/126 . . . {causing radial forces on the bolt-shaft ([F16B 39/36](#) takes precedence)}
- F16B 39/128 {by means of eccentric or spiral interengaging parts}
- F16B 39/14 . . . made of thin sheet material or formed as spring-washers ([locknuts per se made of thin sheet metal F16B 37/02](#))
- F16B 39/16 . . . in which the screw-thread of the locknut differs from that of the nut
- F16B 39/18 in which the locknut grips with screw-thread in the nuts as well as on the bolt
- F16B 39/20 . . by means of steel wire or the like ([F16B 39/10](#) takes precedence)
- F16B 39/22 . . in which the locking takes place during screwing down or tightening ([F16B 39/01](#) takes precedence)
- F16B 39/225 . . {by means of a settable material}
- F16B 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](#))
- F16B 39/26 . . . with spring washers fastened to the nut or bolt-head
- F16B 39/28 . . by special members on, or shape of, the nut or bolt ([F16B 39/26](#) takes precedence; [locknuts F16B 39/12](#))
- F16B 39/282 . . . Locking by means of special shape of work-engaging surfaces, e.g. notched or toothed nuts
- F16B 39/2825 {causing the bolt to tilt}
- F16B 39/284 . . . Locking by means of elastic deformation ([F16B 39/2825](#), [F16B 39/36](#), [F16B 39/38](#) take precedence)
- F16B 39/286 caused by saw cuts
- F16B 39/30 . . . Locking exclusively by special shape of the screw-thread
- F16B 39/32 . . . Locking by means of a pawl or pawl-like tongue
- F16B 39/34 . . . Locking by deformable inserts or like parts
- F16B 39/36 . . . with conical locking parts, which may be split, including use of separate rings co-operating therewith
- F16B 39/38 . . . with a second part of the screw-thread which may be resiliently mounted ([F16B 39/30](#) takes precedence)
- F16B 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](#))
- F16B 41/002 . . {Measures against loss of bolts, nuts or pins (devices for fastening nuts to surfaces [F16B 37/04](#))}

- F16B 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](#))}
- F16B 41/007 . . {by means of two housings hingedly connected which enclose the bolt head}
- F16B 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](#))}
- F16B 43/001 . {for sealing or insulation}
- F16B 43/002 . {with special provisions for reducing friction}
- F16B 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)}
- F16B 43/004 . {with a radial cut in order to improve elasticity of the washer ([F16B 43/005](#) takes precedence)}
- F16B 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)}
- F16B 43/006 . . {in two or more parts hingedly connected}
- F16B 43/007 . . {in two or more parts}
- F16B 2043/008 . {with a cavity for receiving the bolt head in order to make a flush surface }
- F16B 43/009 . {with a wedging effect in order to adjust the height of the washer}
- F16B 43/02 . with special provisions for engaging surfaces which are not perpendicular to a bolt axis or do not surround the bolt
- F16B 43/025 . . {for surfaces not surrounding the bolt, e.g. hook adaptors for bolts}
- F16B 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](#))
- F16B 45/02 . Hooks with a pivoting {or elastically bending} closing member
- F16B 45/025 . . {manoeuvrable remotely with a cable, chain, rod or the like}
- F16B 45/04 . Hooks with a sliding closing member
- F16B 45/06 . Hooks with two symmetrically-pivoting hook parts
- F16B 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](#))}
- F16B 47/003 . {using adhesives for attaching purposes (using adhesives for connecting constructional elements [F16B 11/006](#))}
- F16B 47/006 . {the suction cups being activated by the rotation of a cranked lever arm}