# ECLA EUROPEAN CLASSIFICATION

## F16B DEVICES FOR FASTENING OR SECURING CONSTRUCTIONAL ELEMENTS OR MACHINE PARTS TOGETHER, e.g. NAILS, BOLTS, CIRCLIPS, CLAMPS, CLIPS, WEDGES, JOINTS OR JOINTING

[N: **WARNING**

1. The following IPC groups are not used in the internal ECLA classification scheme. Subject matter covered by these groups is classified in the following ECLA groups:

| | | |
|---|---|---|
| F16B7/08 | covered by | F16B5/12, F16B7/04, F16L3/00 |
| F16B7/12 | " | F16L7/10B |
| F16B7/16 | " | F16L7/14 |
| F16B13/10 | " | F16B13/08 |
| F16B13/13 | " | F16B13/00B, F16B13/12 |
| F16B21/14 | " | F16B21/12, F16B21/12R |
| F16B25/02 | " | F16B25/00 |
| F16B25/04 | " | F16B25/00 |
| F16B25/06 | " | F16B25/00 |
| F16B25/08 | " | F16B25/00 |
| F16B33/04 | " | F16B33/02 |
| F16B37/10 | " | F16B37/08A10, F16B37/08L |

]

**Notes**

1. Attention is drawn to:

   a. the Note following group E04B 1/38;

   b. the following places:

| | |
|---|---|
| A44B | Buckles, slide fasteners |
| A47G3/00 | Ornamental heads for nails, screws, or the like |
| B42F3/00 | Means, not using staples, for attaching sheets temporarily together |
| [N: C14B17/08 | Fastening devices, e.g. clips for leather-stretching used in apparatus or machines for manufacturing or treating skins, hides, leathers or furs] |
| E01B9/10 | Screws or bolts for railway sleepers |
| E01B11/00 | Rail joints |
| E04 | Connections for building |
| E04D13/08 | Clamping means for down pipes for roof drainage |
| E04G5/04 | Fastening scaffolds against buildings |
| E04G7/00 | Scaffolding couplings |
| E05C | Bolts for fasteners for wings, specially for doors or windows |
| F16C29/10 | Locking bearings for parts moving only linearly |
| F16G17/00 | Hooks as integral parts of chains |
| F16L | Pipe joints |
| F16L3/00 | Supports for pipes, cables or protective tubing, e.g. hangers, holders, clamps, cleats, clips, brackets |

F16L33/02 Clips for connecting hoses to rigid members
H01F7/00 Magnetic holding devices
H02N13/00 Electrostatic holding devices.

2. Groups F16B2/00 to F16B47/00 take precedence over group F16B1/00.

**F16B1/00** **Devices for securing together, or preventing relative movement between, constructional elements or machine parts**

F16B1/00B . [N: by the use of a shape-memory material]

F16B1/00M . [N: by the use of a hydraulic action] [N9502]

F16B1/00P . [N: by the use of a pneumatic action] [N9502]

F16B1/00S . [N: with markings, colours, indicators or the like (for indicating tensile load F16B31/02)] [N9605]

F16B1/02 . Means for securing elements of mechanisms after operation (means for bringing members to rest F16D)

F16B1/04 . . disengaged by movement of the actuating member of the element (locking of actuators G05G, e.g. G05G5/00)

**Guide heading:** **Fastenings for constructional elements or machine parts in general** (couplings for transmitting rotation F16D)

**F16B2/00** **Friction-grip releasable fastenings** (for cables or ropes, e.g. cleats F16G11/00) [N: (connections of rods or tubes, e.g. of non-circular section, mutually, including resilient connections F16B7/00)]

F16B2/00B . [N: Means to increase the friction-coefficient]

F16B2/02 . Clamps, i.e. with gripping action effected by positive means other than the inherent resistance to deformation of the material of the fastening

F16B2/04 . . internal, i.e. with spreading action (F16B2/14 to F16B2/18 take precedence)

F16B2/06 . . external, i.e. with contracting action (F16B2/14 to F16B2/18 take precedence)

F16B2/06B . . . [N: using screw-thread elements (F16B2/08 to F16B2/12 take precedence)]

F16B2/08 . . . using bands

F16B2/10 . . . using pivoting jaws

F16B2/12 . . . using sliding jaws

F16B2/14 . . using wedges

F16B2/16 . . using rollers or balls [N: (clamps for rods or tubes telescopically engaged 7/14B;

used in anti-theft monitors, e.g. as used for articles of clothing in shops E05B73/00B)] [C9412]

F16B2/18 . . using cams, levers, eccentrics, or toggles [N: (for connections of rods or tubes engaged telescopically F16B7/14C, F16B7/14E, F16B7/14H)] [C9412]

F16B2/18L . . . [N: using levers] [N1105]

F16B2/20 . Clips, i.e. with gripping action effected soley by the inherent resistance to deformation of the material of the fastening

F16B2/20B . . [N: with two stable positions]

F16B2/22 . . of resilient material, e.g. rubbery material [N: (F16B2/20B takes precedence)]

F16B2/24 . . . of metal

F16B2/24B . . . . [N: of sheet metal]

F16B2/24B2 . . . . . [N: internal, i.e. with spreading action]

F16B2/24B3 . . . . . [N: external, i.e. with contracting action]

F16B2/24B3B . . . . . [N: 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]

F16B2/24C . . . . [N: of wire]

F16B2/26 . . of pliable, non-resilient material, e.g. plant tie

**F16B3/00** **Key-type connections; Keys** (F16B2/00 takes precedence; for rods or tubes mutually F16B7/00)

F16B3/00B . [N: the key being formed by solidification of injected material (joining of preformed parts by applying molten plastics B29C65/40; non-disconnectible pipe joints obtained using a hardenable filler F16L13/11)]

F16B3/04 . 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

F16B3/06 . using taper sleeves

**F16B4/00** **Shrinkage connections, e.g. assembled with the part at different temperature; Force fits** (restricted to metal parts or objects B23P11/02)**; Non-releasable friction-grip fastenings** (F16B2/00 takes precedence; [N: using members with a shape-memory material F16B1/00B])

F16B4/00B . [N: engaging or disengaging by means of fluid pressure]

F16B4/00P . [N: Press fits, force fits, interference fits, i.e. fits without heat or chemical treatment (F16B4/00B takes precedence)]

F16B4/00T . [N: Shrinkage connections, e.g. assembled with the parts being at different temperature]

F16B4/00T2 . . [N: using heat-recoverable, i.e. shrinkable, sleeves]

**F16B5/00** **Joining sheets or plates,** [N: e.g. panels]**, to one another or to strips or bars parallel to them** ([N: F16B17/00B takes precedence]; by sticking together F16B11/00; dowel connections F16B13/00; pins, including deformable elements F16B19/00; covering of walls E04F13/00; fastening signs, plates, panels or boards to a supporting structure,

fastening readily-detachable elements, e.g. letters to signs, plates, panels, or boards, G09F7/00) [C9410]

F16B5/00A . [N: Joining sheets, plates or panels in abutting relationship (F16B5/01 takes precedence)] [N9410]

F16B5/00A1 . . [N: by moving the sheets, plates or panels substantially in their own plane, perpendicular to the abutting edge] [N9410]

F16B5/00A1B . . . [N: 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] [N9410]

F16B5/00A1B2 . . . . [N: with snap action] [N9410]

F16B5/00A1C . . . [N: both sheets, plates or panels having a groove, e.g. with strip-type connector] [N9410]

F16B5/00A1D . . . [N: the sheets, plates or panels having holes, e.g. for dowel- type connections] [N9410]

F16B5/00A1E . . . [N: using I-shaped connectors (with flanges moving towards each other F16B5/00A3D)] [N9410]

F16B5/00A2 . . [N: by moving the sheets, plates, or panels or the interlocking key parallel to the abutting edge] [N9410]

F16B5/00A2B . . . [N: and using hook and slot or keyhole-type connections] [N9410]

F16B5/00A2C . . . [N: and using C-shaped clamps] [N9410]

F16B5/00A2D . . . [N: and using interlocking keys of circular, square, rectangular or like shape] [N9410]

F16B5/00A2D2 . . . . [N: hinge-like] [N9410]

F16B5/00A2E . . . [N: the interlocking key acting as a dovetail-type key] [N9410]

F16B5/00A3 . . [N: by moving the sheets, plates or panels or the interlocking key perpendicular to the main plane] [N9410]

F16B5/00A3B . . . [N: and using ring-shaped clamps] [N9410]

F16B5/00A3C . . . [N: and using C-shaped clamps] [N9410]

F16B5/00A3D . . . [N: and using I-shaped clamps with flanges moving towards each other] [N9410]

F16B5/00A3D2 . . . . [N: and using screw-thread] [N9410]

F16B5/00A3E . . . [N: and using expanding clamps] [N9410]

F16B5/00A4 . . [N: by a rotating or sliding and rotating movement] [N9410]

F16B5/00A10 . . [N: characterised by particular locking means (not used, see subgroups)] [N9410]

F16B5/00A10A . . . [N: with locking means moving substantially perpendicular to the main plane, e.g. pins, screws] [N9410]

F16B5/00A10B . . . [N: with locking means rotating about an axis parallel to the main plane and perpendicular to the abutting edge, e.g. screw, bayonet] [N9410]

F16B5/00P . [N: by using permanent deformation] [N9410]

F16B5/01 . by means of fastening elements specially adapted for honeycomb panels

F16B5/02 . by means of fastening members using screw-thread ([N: F16B5/00A takes precedence]; construction of screw-threaded connections F16B25/00 to F16B39/00) [C9410]

F16B5/02A . . [N: using panel fasteners, i.e. permanent attachments allowing for quick assembly]

F16B5/02B . . [N: the position of the plates to be connected being adjustable]

F16B5/02B2 . . . [N: allowing for adjustment parallel to the plane of the plates]

F16B5/02B4 . . . [N: allowing for adjustment perpendicular to the plane of the plates]

F16B5/02C . . [N: with the possibility for the connection to absorb deformation, e.g. thermal or vibrational]

F16B5/02D . . [N: specially designed to compensate for misalignement or to eliminate unwanted play]

F16B5/02G . . [N: using resiliently deformable sleeves, grommets or inserts (43/00B takes precedence)]

F16B5/02K . . [N: using springs]

F16B5/02R . . [N: the screw-threaded element having at least two axially separated threaded portions (F16B5/02S takes precedence)]

F16B5/02S . . [N: 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]

F16B5/02W . . [N: the threaded element being driven through the edge of a sheet plate with its axis in the plane of the plate] [N9410]

F16B5/04 . by means of riveting (rivets F16B19/04)

F16B5/04B . . [N: without the use of separate rivets]

F16B5/06 . by means of clamps or clips ([N: F16B5/00A takes precedence]; friction-grip releasable fastenings in general F16B2/00) [C9410]

F16B5/06B . . [N: joining sheets or plates to each other (F16B5/06D, F16B21/08E take precedence)] [C9702]

F16B5/06B2 . . . [N: in angled relationship]

F16B5/06B3 . . . [N: in parallel relationship (fastened by a drive-pin 19/10B2D; fastened by a device locking by rotation F16B21/02)] [C9604]

F16B5/06B3A . . . . [N: allowing for adjustment parallel or perpendicular to the plane of the sheets or plates] [N9604]

F16B5/06B3B . . . . [N: fastened over the edges of the sheets or plates]

F16B5/06B3D . . . . [N: the plates being arranged one on top of the other and in full close contact with each other] [N1103]

F16B5/06B3F . . . . [N: the plates being one on top of the other and distanced from each other, e.g. by using protrusions to keep contact and distance] [N1103]

F16B5/06B3H . . . . [N: 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] [N1103]

F16B5/06B3J . . . . [N: at least one of the sheets or plates having integrally formed or integrally connected snap-in-features] [N1103]

F16B5/06C . . [N: Joining sheets or plates to strips or bars (F16B5/06D takes precedence)]

F16B5/06D . . [N: joining flexible sheets to other sheets or plates or to strips or bars (tent fastenings E04H15/64; coping elements for swimming pools with fixing means for sealing foil E04H4/14A1; greenhouses of flexible synthetic material A01G9/14B; end or aperture-closing arrangements or devices for sacks or bags B65D33/16)]

F16B5/07 . by means of multiple interengaging protrusions on the surfaces, e.g. hooks, coils,

F16B5/08 . by means of welds or the like (welding B23K)

F16B5/10 . by means of bayonet connections ([N: F16B5/00A10B takes precedence]; fastening devices locking by rotation F16B21/02) [C9410]

F16B5/12 . 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 F16B2/00; fastening rods or tubular parts to flat surfaces at an angle F16B9/00)

F16B5/12B . . [N: fastened over the edge(s) of the sheet(s) or plate(s)]

F16B5/12F . . [N: Auxiliary fasteners specially designed for this purpose] [N1103]

F16B5/12F4 . . . [N: one of the auxiliary fasteners is comprising wire or sheet material or is made thereof] [N1103]

F16B5/12J . . [N: at least one of the sheets, plates, bars or strips having integrally formed or integrally connected snap-in-features] [N1103]

F16B5/12U . . [N: 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] [N1103]

**F16B7/00** **Connections of rods or tubes, e.g. of non-circular section, mutually, including resilient connections** ([N: F16B11/00F2, F16B17/00B take precedence]; umbrella frames A45B25/02; 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) [C9601]

F16B7/02 . with conical parts

F16B7/02K . . [N: 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 F16B7/14K)] [C9412]

F16B7/04 . Clamping or clipping connections (friction-grip releasable fastenings in general F16B2/00)

F16B7/04B . . [N: for rods or tubes being coaxial (F16B7/10 takes precedence)]

F16B7/04B2 . . . [N: for tubes using the innerside thereof (F16B7/02K takes precedence)]

F16B7/04B2H . . . . [N: with a locking element, e.g. pin, ball or pushbutton, engaging in a hole in the wall of at least one tube] [N9607]

F16B7/04B4 . . . [N: for rods or for tubes without using the innerside thereof]

F16B7/04C . . [N: for rods or tubes being in parallel relationship]

F16B7/04D . . [N: for rods or tubes being in angled relationship]

F16B7/04D2 . . . [N: for tubes using the innerside thereof (F16B7/02K takes precedence)]

F16B7/04D2C . . . . [N: the tubes being drawn towards each other (F16B7/04D2E takes precedence)]

F16B7/04D2C2 . . . . . [N: by rotating an eccenter-mechanism]

F16B7/04D2C4 . . . . . [N: by a screw-threaded stud with a conical tip acting on an inclined surface]

F16B7/04D2E . . . . [N: with hook-like parts gripping, e.g. by expanding, behind the flanges of a profile]

F16B7/04D4 . . . [N: for rods or for tubes without using the innerside thereof]

F16B7/04D4E . . . . [N: forming an abutting connection of at least one tube]

F16B7/04D4L . . . . [N: forming a crossed-over connection]

F16B7/06 . Turnbuckles (for cables, ropes, or wire F16G11/12)

F16B7/10 . Telescoping systems [N: for vertically adjustable chairs A47C3/20; telescopic steering columns B62D1/18]; for scaffolding E04G25/04; [N: telescopic masts, poles or the like

E04H12/18B; telescopic door or window holders E05C17/30]; telescope props for mining E21D15/14 to E21D15/46; stands or trestles as supports for apparatus or articles placed thereon [N: F16M11/26] [C9810]

F16B7/10B . . [N: locking in discrete positions, e.g. in extreme extended position]

F16B7/14 . . locking in intermediate [N: non-discrete] positions [N: (the rod or tube being locked by a tilting clip F16B2/24B3B)] [C9412]

F16B7/14B . . . [N: with balls or rollers urged by an axial displacement of a wedge or a conical member] [N9412]

F16B7/14C . . . [N: with a clamping collar or two split clamping rings tightened by a screw or a cammed latch member] [N9412]

F16B7/14E . . . [N: with cammed or eccentrical surfaces co-operating by relative rotation of the telescoping members or by rotation of an external collar] [N9412]

F16B7/14E2 . . . . [N: with rollers or balls] [N9412]

F16B7/14G . . . [N: with a rubber bushing gripping inside the outer telescoping member by a radial expansion due to its axial compression (F16B7/14K takes precedence)] [N9412] [C9604]

F16B7/14H . . . [N: with a clamp locking the telescoping members by swinging a handle provided with a locking cam (F16B7/14C takes precedence)] [N9412]

F16B7/14K . . . [N: with the expansion of an element inside the outer telescoping member due to the axial movement towards a wedge or a conical member] [N9412]

F16B7/14P . . . [N: with a clamping screw perpendicular to the axis of the telescoping members] [N9412]

F16B7/14S . . . [N: with a gripping helical spring] [N9412]

F16B7/14T . . . [N: with a sleeve or ring having a tapered or conical surface (F16B7/14K takes precedence)] [N9412]

F16B7/18 . using screw-thread elements [N: (F16B7/02K takes precedence; for turnbuckles F16B7/06)]

F16B7/18B . . [N: for coaxial connections of two rods or tubes]

F16B7/18C . . [N: with a node element] [N9702]

F16B7/18N . . [N: with sliding nuts or other additional connecting members for joining profiles provided with grooves or channels (channel nuts per se F16B37/04E)] [N9601] [C9604]

F16B7/20 . using bayonet connections

F16B7/22 . using hooks or like elements

**F16B9/00** **Connections of rods or tubular parts to flat surfaces at an angle** ([N: F16B17/00B takes precedence]; friction-grip releasable fastenings in general F16B2/00; making press-fit connections B23P11/00, B23P19/00; fluid-tight connecting of pipes to reservoirs, sheets, or the like F16L, e.g. joining pipes to walls F16L41/00)

F16B9/02 . Detachable connections

F16B9/02B . . [N: using clamps or clips]

F16B9/02C . . [N: using screw-thread elements]

**F16B11/00** **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 C09J5/00)

F16B11/00B . [N: by pressing the elements together so as to obtain plastic deformation (shrinkage connections, force fits F16B4/00; pin-and-hole connections F16B17/00)]

F16B11/00D . [N: by cold pressure welding]

F16B11/00F . [N: by gluing (gluing of plastics material B29C65/48)]

F16B11/00F2 . . [N: of tubular elements or rods in coaxial engagement] [N9601]

**F16B12/00** **Jointing of furniture or the like, e.g. hidden from exterior** (F16B2/00 to F16B11/00 take precedence; fastening means per se F16B13/00 to F16B47/00; wood-working B27)

F16B12/02 . Joints between panels and corner posts

F16B12/04 . Non-loosenable joints for non-metal furniture parts, e.g. glued

F16B12/06 . Non-loosenable joints for metal furniture parts

F16B12/08 . . without use of separate connecting elements

F16B12/10 . using pegs, bolts, tenons, clamps, clips, or the like (glued F16B12/04; fastening means per se F16B15/00 to F16B47/00)

F16B12/12 . . for non-metal furniture parts, e.g. made of wood, of plastics

F16B12/12M . . . [N: using mortise and tenon joints] [N9410]

F16B12/14 . . . using threaded bolts or screws

F16B12/16 . . . . using self-tapping screws

F16B12/18 . . . . using drawing bars

F16B12/20 . . . using clamps, clips, wedges, sliding bolts, or the like

F16B12/20B . . . . [N: actuated by rotary motion]

F16B12/20B2 . . . . . [N: with rotating excenters or wedges] [N0504]

F16B12/20B2B . . . . . [N: with rotating excenters or wedges acting on a head of a pin or screw] [N0504]

F16B12/20B4 . . . . . [N: with engaging screw threads as securing means for limiting movement] [N0504]

F16B12/20B4B . . . . . [N: with engaging screw threads as tightening means] [N0504]

F16B12/22 . . . using keyhole-shaped slots and pins

F16B12/24 . . . using separate pins, dowels, or the like

F16B12/26 . . . using snap-action elements

F16B12/28 . . for metal furniture parts

F16B12/30 . . . using threaded bolts

F16B12/32 . . . using clamps, clips, wedges, sliding bolts, or the like

F16B12/34 . . . using keyhole-shaped slots and pins

F16B12/36 . . . using separate pins, dowels or the like

F16B12/38 . . . using snap-action elements

F16B12/40 . Joints for furniture tubing

F16B12/42 . . connecting furniture tubing to non-tubular parts [N: (connecting table tops to underframes A47B13/00C)]

F16B12/44 . Leg joints; Corner joints
F16B12/46 . . Non-metal corner connections
F16B12/48 . . Non-metal leg connections (F16B12/46 takes precedence)
F16B12/50 . . Metal corner connections
F16B12/52 . . Metal leg connections (F16B12/50 takes precedence)

F16B12/54 . Fittings for bedsteads or the like
F16B12/56 . . Brackets for bedsteads; Coupling joints consisting of bolts or the like; Latches therefor
F16B12/58 . . Tapered connectors for bed rails
F16B12/60 . . Fittings for detachable side panels

**F16B13/00** **Dowels or other devices fastened in walls or the like by inserting them in holes made therein for that purpose** (nails F16B15/00; self-locking pins or bolts in general, stud-and-socket releasable fastenings F16B21/00; dowels or bolts for railroad sleepers E01B9/00; ans means for anchoring structural elements or bulkheads specially adapted to foundation engineering E02D5/74; bolts or dowels used while laying bricks or casting concrete sleepers E04B1/38; setting anchoring bolts in shafts, tunnels or galleries E21D20/00; anchoring bolts for shafts, tunnels or galleries E21D21/00)

F16B13/00A . [N: with means for preventing rotation of the dowel] [N9501]

F16B13/00B . [N: self-cutting]
F16B13/00B2 . . [N: with a separate drilling bit attached to or surrounded by the dowel element] [N9603]
F16B13/00B4 . . [N: with a drilling sleeve driven against a tapered or spherical plug] [N9603]

F16B13/00C . [N: formed in integral series but easily separable]

F16B13/02 . in one piece with protrusion or ridges on the shaft
F16B13/02B . . [N: of rolled sheet material]

F16B13/04 . with parts gripping in the hole or behind the reverse side of the wall after inserting from the front ([N: F16B13/00B and F16B13/12 take precedence;] friction-grip releasable fastenings in general F16B2/00)
F16B13/04A . . [N: having axially compressing parts allowing the clamping of an object tightly to the wall]
F16B13/06 . . combined with expanding sleeve [N: (F16B13/04A and F16B13/08 take precedence)]
F16B13/06A . . . [N: of the buckling type]
F16B13/06D . . . [N: by the use of an expander]
F16B13/06D2 . . . . [N: fastened by extracting the screw, nail or the like]
F16B13/06D4 . . . . [N: fastened by extracting a separate expander-part, actuated by the screw, nail or the like]
F16B13/06D4B . . . . . [N: expanded in two or more places]
F16B13/08 . . with separate [N: or non-separate] gripping parts moved into their final position in relation to the body of the device without further manual operation
F16B13/08B . . . [N: by a toggle-mechanism]

F16B13/08D . . . [N: with a wedging drive-pin] [N9412]

F16B13/08E . . . [N: with a locking element, e.g. sleeve, ring or key co-operating with a cammed or eccentrical surface of the dowel body] [N9412]

F16B13/08F . . . [N: with segments or fingers expanding or tilting into an undercut hole (F16B13/08P takes precedence)] [N9412]

F16B13/08G . . . [N: with a deformable sleeve member driven against the abutting surface of the head of the bolt or of a plug] [N9412]

F16B13/08N . . . [N: with a drive-nail deflected by an inclined surface in the dowel body (nails with spreading shaft F16B15/04)] [N9412]

F16B13/08P . . . [N: with an expansible sleeve or dowel body driven against a tapered or spherical expander plug (F16B13/00B4 takes precedence)] [N9412] [C9603]

F16B13/08R . . . [N: with prongs penetrating into the wall of the hole by a retractile movement of a threaded member] [N9412]

F16B13/08S . . . [N: with elastic discs or spring washers anchoring in the hole] [N9412]

F16B13/08T . . . [N: with split rings or wire between the threads of the dowel body or in grooves near a conical surface (F16B13/08E takes precedence)] [N9412]

F16B13/08W . . . [N: with a locking element, e.g. wedge, key or ball moving along an inclined surface of the dowel body (F16B13/08D, F16B13/08E, F16B13/08T take precedence)] [N9412]

F16B13/12 . Separate metal [N: or non-separate or non-metal] dowel sleeves fastened by inserting the screw, nail or the like [N: (F16B13/08B takes precedence)] [C9810]

F16B13/12A . . [N: made from a sheet-metal blank] [N9411]

F16B13/12B . . [N: fastened by inserting a threaded element, e.g. screw or bolt (F16B13/12A, F16B13/12D take precedence)] [C9902]

F16B13/12C . . [N: fastened by inserting an unthreaded element, e.g. pin or nail (F16B13/12A, F16B13/12D take precedence)] [C9902]

F16B13/12D . . [N: with extending protrusions, e.g. discs, segments, ridges, fingers or tongues (F16B13/12A takes precedence)] [N9902]

F16B13/14 . Non-metallic plugs or sleeves [N: not used, see F16B13/00B- F16B13/12]; Use of liquid, loose solid or kneadable material therefor

F16B13/14C . . [N: Fixing plugs in holes by the use of settable material]

F16B13/14C1 . . . [N: characterised by the composition of the setting material or mixture (F16B13/14C2 takes precedence)] [N9509]

F16B13/14C2 . . . [N: using frangible cartridges or capsules containing the setting components] [N9509]

F16B13/14C2B . . . . [N: characterised by the shape or configuration or material of the frangible cartridges or capsules] [N9509]

F16B13/14C2C . . . . [N: characterised by the composition of the setting agents contained in the frangible cartridges or capsules] [N9509]

F16B13/14C4 . . . [N: 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] [N9501]

**Guide heading:** **Fastening means without screw-thread** (horseshoe nails A01L7/10; nails for footwear A43B23/20; thumb- tacks B43M15/00; for building constructions E04B1/38; for hand railings E04F11/18; for fencing E04H17/00)

**F16B15/00** **Nails; Staples** (surgical staples A61B17/064; manufacture of nails or staples B21G; [N: drawing-pins, thumb-tacks B43M15/00]; railway spikes E01B9/06) [C1207]

F16B15/00A . [N: with two nail points extending in opposite directions, in order to fix two workpieces together] [N9505]

F16B15/00B . [N: Staples]

F16B15/00C . [N: Nail plates (claw dowels for building structures E04B1/49; machines for driving in nail plates B27F7/15)]

F16B15/00C2 . . [N: with teeth cut out from the material of the plate]

F16B15/00C2B . . . [N: only on the perimeter of the plate]

F16B15/00C2D . . . [N: from the body of the plate]

F16B15/00C3 . . [N: with separate nails attached to the plate]

F16B15/00D . [N: Coated nails or staples]

F16B15/02 . with specially-shaped heads, e.g. with enlarged surfaces (ornaments for furniture A47B95/04; removable ornamental heads for nails A47G3/00)

F16B15/04 . with spreading shaft [N: (dowels with a drive-nail deflected by an inclined surface in the dowel body F16B13/08N)] [C9412]

F16B15/06 . with barbs, e.g. for metal parts; Drive screws

F16B15/08 . formed in integral series but easily separable

**F16B17/00** **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 F16B19/00; riveting F16B19/04; means for preventing withdrawal of a pin, spigot or the like from its operative position, stud-and-socket releasable fastenings F16B21/00)

F16B17/00B . [N: Non-releasable connections, i.e. by means of plastic deformation]

F16B17/00B2 . . [N: of rods or tubes mutually]

F16B17/00B4 . . [N: of rods or tubes to sheets or plates]

F16B17/00B6 . . [N: of sheets or plates mutually]

**F16B19/00** **Bolts without screw-thread; Pins, including deformable elements** (in screwed connections F16B29/00)**; Rivets** (means for preventing withdrawal F16B21/00)

F16B19/00A . [N: Resiliently deformable pins (F16B21/06 takes prededence)]

F16B19/00A2 . . [N: made in one piece (F16B21/08F takes precedence)] [C9803]

F16B19/00E . [N: with sealing means]

F16B19/02 . Bolts or sleeves for positioning of machine parts, e.g. notched taper pins, fitting pins, sleeves, eccentric positioning rings

F16B19/04 . Rivets; Spigots or the like fastened by riveting (lead seals G09F 3/00)

F16B19/05 . . Bolts fastening by swaged-on collars (F16B19/08 takes precedence)

F16B19/06 . . Solid rivets made in one piece

F16B19/08 . . Hollow rivets; Multi-part rivets

F16B19/08B . . . [N: Self-drilling rivets]

F16B19/08C . . . [N: Self-piercing rivets]

F16B19/10 . . . fastened by expanding mechanically

[N: **Notes**

1. Subject matter relating to hollow or single-part rivets fastened by a pull-through mandrel is classified in 19/10B2B

2. Subject matter relating to hollow or single-part rivets fastened by a drive pin is classified in F16B19/10B2D

]

F16B19/10B . . . . [N: Multi-part rivets]

F16B19/10B2 . . . . . [N: Blind rivets]

F16B19/10B2B . . . . . [N: fastened by a pull - mandrel or the like (F16B19/10B2E takes precedence)]

F16B19/10B2B2 . . . . . {7 dots} [N: the pull-mandrel or the like being frangible] [N1105]

F16B19/10B2B4 . . . . . {7 dots} [N: with a sleeve or collar sliding over the hollow rivet body during the pulling operation]

F16B19/10B2B6 . . . . . {7 dots} [N: 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 F16B37/06B2B)] [N1105]

F16B19/10B2D . . . . . [N: fastened by a drive-pin (F16B19/10B2E takes precedence)]

F16B19/10B2E . . . . . [N: 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 B21J15/42; hand tools for temporarily connecting sheets before or during assembly operations B25B31/00B)]

F16B19/12 . . . fastened by fluid pressure, including by explosion (bolts shot by means of detonation-operated nailing tools into concrete constructions, metal walls or the like F16B19/14)

F16B19/12B . . . . [N: fastened by explosion]

F16B19/14 . 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)

**F16B21/00** **Means for preventing relative axial movement of a pin, spigot, shaft or the like and a member surrounding it** (riveted or deformable spigots F16B19/04; for gudgeon pins F16J1/18)**; Stud-and-socket releasable fastenings** [C9604]

F16B21/02 . Releasable fastening devices locking by rotation (with snap-action F16B21/06; studs or coupling pins with resilient protrusions 21/08)

F16B21/04 . . with bayonet catch

F16B21/06 . Releasable fastening devices with snap-action [N: (quickly-detachable or mountable nuts to threaded bolts F16B37/08A10)] [C9810]

F16B21/06A . . [N: with an additional locking element] [N9702]

F16B21/07 . . in which the socket has a resilient part [N: (F16B21/06A takes precedence)] [C9702]

F16B21/07J . . . [N: the socket being integrally formed with a component to be fasted, e.g. a sheet, plate or strip] [N1103]

F16B21/07L . . . [N: the socket having a resilient part on its inside] [N1103]

F16B21/07L2 . . . . [N: the socket having resilient parts on its inside and outside] [N1103]

F16B21/07M . . . [N: the socket having a resilient part on its outside (F16B21/07L2 takes precedence)] [N1103]

F16B21/07P . . . [N: the socket having a further molded-in or embedded component, e.g. a ring with snap-in teeth molded into it (F16B21/06A takes precedence)] [N1103]

F16B21/08 . . in which the stud, pin, or spigot has a resilient part ([N: F16B21/06A, F16B21/12R, F16B21/16B, F16B37/04B3 take precedence]; wall-dowels F16B13/00) [C9702]

F16B21/08E . . . [N: the stud, pin or spigot having two resilient parts on its opposite ends in order to connect two elements] [N9702]

F16B21/08F . . . [N: 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] [N9803] [C1103]

F16B21/08H . . . [N: 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] [N1103]

F16B21/08J . . . [N: the stud, pin or spigot being integrally formed with the component to be fastened, e.g. forming part of the sheet, plate or strip] [N1103]

F16B21/09 . Releasable fastening devices with a stud engaging a keyhole slot

F16B21/10 . by separate parts ([N: F16B21/06 takes precedence]; key-type connection F16B3/00; locking screws or nuts against rotation by such means F16B39/04)

F16B21/12 . . with locking-pins or split-pins thrust into holes

F16B21/12R . . . [N: radially resilient or with a snap-action member, e.g. elastic tooth, pawl with spring, resilient coil or wire] [N9604]

F16B21/16 . . with grooves or notches in the pin or shaft

F16B21/16B . . . [N: with balls or rollers (for connections of rods or tubes engaged telescopically F16B7/14B)] [C9412]

F16B21/18 . . . with circlips or like resilient retaining devices, [N: i.e. resilient in the plane of the ring or the like]; Details (spring-washers for locking nuts F16B39/24; adjusting rings F16B43/00)

F16B21/18B . . . . [N: internal, i.e. with spreading action]

F16B21/18C . . . . [N: external, i.e. with contracting action]

F16B21/20 . . for bolts or shafts without holes, grooves, or notches for locking members [N: (by rings resilient in their plane F16B21/18)]

F16B21/20H . . . [N: the connecting means having gripping edges in the form of a helix] [N9507]

**Guide heading:** **Fastening means using screw-thread** (wall-dowels F16B13/00; manufacture of threaded fastening means B21H, B21K, B23G; screws or bolts for railway sleepers E01B9/10;screw mechanisms F16H)

**F16B23/00** **Specially shaped** [N: nuts or] **heads of bolts or screws for rotations by a tool** [N: (detachable ornamental heads for screws A47G3/00; screwdrivers, wrenches B25B)]

F16B23/00B . [N: characterised by the shape of the recess or the protrusion engaging the tool (F16B23/00P and F16B23/00S take precedence)]

F16B23/00B2 . . [N: substantially rectangular, e.g. one-slot head]

F16B23/00B4 . . [N: substantially cross-shaped]

F16B23/00B6 . . [N: star-shaped or multi-lobular, e.g. Torx-type, twelve-point star]

F16B23/00B8 . . [N: substantially prismatic with up to six edges, e.g. triangular, square, pentagonal, Allen-type cross-sections]

F16B23/00B10 . . [N: having one eccentric circular or polygonal recess or protrusion]

F16B23/00C . [N: with a conical or prismatic recess for receiving a centering pin of the tool apparatus]

F16B23/00E . [N: with grooves, notches or splines on the external peripheral surface designed for tools engaging in radial direction (F16B23/00B6 takes precedence)]

F16B23/00P . [N: with holes to be engaged with corresponding pins on the tool or protruding pins to be engaged with corresponding holes on the tool]

F16B23/00S . [N: causing slipping of the tool in loosening rotation, i.e. disabling unscrewing unless another tool is used (F16B31/02T takes precedence)] [C9708]

F16B23/00T . [N: with a threaded engagement between the head of the bolt or screw and the tool]

F16B23/00U . [N: with a head engageable by two or more different tools (F16B23/00S takes precedence)]

**F16B25/00** **Screws that cut thread in the body into which they are screwed, e.g. wood screws** [N: (F16B35/06B takes precedence; joining sheets or plates using screws with two separate threads F16B5/02R, using screws with adjustment sleeves F16B5/02S)]

F16B25/00A . [N: of the helical wire type (Threaded wire-inserts F16B37/12)]

F16B25/00C . [N: characterised by the material of the body into which the screw is screwed] [N1202]

F16B25/00C1 . . [N: the material being a soft organic material, e.g. wood or plastic (F16B25/00C4 takes precedence)] [N1202]

F16B25/00C2 . . [N: the material being metal, e.g. sheet-metal or aluminium (F16B25/00C4 takes precedence)] [N1202]

F16B25/00C3 . . [N: the material being a hard non-organic material, e.g. stone, concrete or drywall (F16B25/00C4 takes precedence)] [N1202]

F16B25/00C4 . . [N: the screw being designed to be screwed into different materials, e.g. a layered structure or through metallic and wooden parts] [N1202]

F16B25/00G . [N: characterised by geometric details of the screw] [N1202]

F16B25/00G1 . . [N: characterised by the geometry of the thread, the thread being a ridge wrapped around the shaft of the screw] [N1202]

F16B25/00G1A . . . [N: the ridge being characterised by its cross-section in the plane of the shaft axis] [N1202]

F16B25/00G1B . . . [N: the ridge having indentations, notches or the like in order to improve the cutting behaviour] [N1202]

F16B25/00G1C . . . [N: the screw having distinct axial zones, e.g. multiple axial thread sections with different pitch or thread cross-sections] [N1202]

F16B25/00G1C1 . . . . [N: with a non-threaded portion on the shaft of the screw] [N1202]

F16B25/00G1D . . . [N: with multiple-threads, e.g. a double thread screws] [N1202]

F16B25/00G1E . . . [N: characterised by its pitch, e.g. a varying pitch] [N1202]

F16B25/00G2 . . [N: with a shaft of non-circular cross-section or other special geometric features of the shaft] [N1202]

F16B25/00G3 . . [N: characterised by geometric details of the tip] [N1202]

F16B25/00G4 . . [N: the screw having wings] [N1202]

F16B25/00G5 . . [N: 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] [N1202]

F16B25/10 . Screws performing an additional function to thread-forming, e.g. drill screws [N: or self-piercing screws]

F16B25/10B . . [N: by means of a drilling screw-point, i.e. with a cutting and material removing action]

F16B25/10D . . [N: by means of a self-piercing screw-point, i.e. without removing material]

**F16B27/00** **Bolts, screws, or nuts formed in integral series but easily separable, particularly for use in automatic machines** [N: (Arrangements for feeding screws or nuts in spanners, wrenches or screw-drivers with built-in magazines B25B23/06)]

**F16B29/00** **Screwed connection with deformation of nut or auxiliary member while fastening** ([N: Nuts fastened to surfaces by riveting F16B37/06B2]; members deformed for locking screws, bolts or nuts F16B39/22)

**F16B31/00** **Screwed connections specially modified in view of tensile load; Break-bolts** (shape of thread [N: F16B33/02; in couplings F16D9/00]) [C9810]

F16B31/00E . [N: Breakbolts loosening due to the action of an explosive charge]

F16B31/00F . [N: Break-bolts loosening at high temperature]

F16B31/02 . for indicating [N: the attainment of a particular tensile load] or limiting tensile load [N: (apparatus for, or method of, determining value of torque or twisting moment for thightening a nut or other member similarly stressed G01L5/24)] [C9106]

F16B31/02B . . [N: by means of a frangible part (F16B31/02P, F16B31/02W take precedence; break members in torque limiters or torque indicators in wrenches or screwdrivers B25B23/14D)] [C9511]

F16B31/02F . . [N: 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] [N9511]

F16B31/02P . . [N: with a gauge pin in a longitudinal bore in the body of the bolt] [N9511]

F16B31/02T . . [N: with a bolt head causing the fastening or the unfastening tool to lose the grip when a specified torque is exceeded] [N9708]

F16B31/02W . . [N: with a load-indicating washer or washer assembly] [N9511]

F16B31/04 . for maintaining [N: a] tensile load

F16B31/04B . . [N: Prestressed connections tensioned by means of liquid, grease, rubber, explosive charge, or the like (hydraulic bolt tensioners B25B29/02)]

F16B31/06 . having regard to possibility of fatigue rupture

**F16B33/00** **Features common to bolt and nut**

F16B33/00A . [N: Means for preventing rotation of screw-threaded elements (F16B39/00 takes precedence)]

F16B33/00B . [N: Sealing; Insulation (by means of washers F16B43/00B)]

F16B33/00C . [N: Non-metallic fasteners using screw-thread]

F16B33/00R . [N: Corrosion preventing means] [N9604]

F16B33/02 . Shape of thread; Special thread-forms ([N: F16B25/00 takes precedence; used to remove paint or dirt layers F16B35/00C, F16B37/00B]; used as screw-locking device F16B39/30)

F16B33/06 . Surface treatment of parts furnished with screw-thread, e.g. for preventing seizure [N: or fretting (corrosion preventing means F16B33/00R; settable coatings for locking threaded members F16B39/22B; deformable coatings for locking threaded members F16B39/34)] [C9610]

**F16B35/00** **Screw-bolts; Stay-bolts; Screw-threaded studs; Screws; Set screws** ([N: F16B33/00R takes precedence; joining sheets or plates using screws with two separate threads F16B5/02R; using screws with adjustment sleeves 5/02S]; thread cutting screws F16B25/00)

[N: **Note**
The fastening of heads of screws or heads of bolts to surfaces is classified in F16B37/04
]

F16B35/00A . [N: onto which threads are cut during screwing (F16B37/00B takes precedence)]

F16B35/00B . [N: Set screws; Locking means therefor]

F16B35/00C . [N: Removing paint or dirt layers covering the threaded part of nut-like members]

F16B35/02 . divided longitudinally

F16B35/04 . 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 F16B39/00)

F16B35/04B . . [N: Specially-shaped shafts (shape of thread F16B33/02)]

F16B35/04B1 . . . [N: for retention or rotation by a tool, e.g. of polygonal cross-section] [N9505]

F16B35/04B2 . . . [N: Specially-shaped ends]

F16B35/04B2B . . . . [N: for retention or rotation by a tool (specially shaped heads of bolts or screws for rotation by a tool F16B23/00)]

F16B35/04B2H . . . . [N: for preventing cross-threading, i.e. preventing skewing of bolt and nut] [N0205]

F16B35/04B4 . . . [N: Specially-shaped necks (F16B35/06 takes precedence)]

F16B35/06 . . Specially-shaped heads (special shape in order to rotate the bolt F16B23/00)[N: (separate hook adaptors for bolts F16B43/02B)]

F16B35/06B . . . [N: with self-countersink-cutting means]

**F16B37/00** **Nuts or like thread-engaging members** [N: (specially shaped for rotations by a tool F16B23/00)]

F16B37/00B . [N: cutting threads during screwing; removing paint or dirt layers covering threaded shanks]

F16B37/00C . [N: into which threads are cut during screwing]

F16B37/02 . made of thin sheet material (fastening to surfaces F16B37/04; [N: used as lock-nuts F16B39/14])

F16B37/04 . Devices for fastening nuts to surfaces, e.g. sheets, plates [N: (nuts fastened behind a wall by a toggle-mechanism F16B13/08B; threaded inserts F16B37/12B; measures against loss of bolts, nuts or pins F16B41/00B)] [C9810]

F16B37/04B . . [N: Releasable devices (F16B37/04C, F16B37/04E take precedence)]

F16B37/04B2 . . . [N: locking by rotation]

F16B37/04B3 . . . [N: with snap action]

F16B37/04C . . [N: Nut cages]

F16B37/04E . . [N: specially adapted for fastening in channels, e.g. sliding bolts, channel nuts]

F16B37/04E1 . . . [N: with resilient means for urging the nut inside the channel]

F16B37/04E2 . . . [N: Barrel nuts]

F16B37/04H . . [N: Non-releasable devices (F16B37/04C, F16B37/04E and F16B37/06 take precedence)]

F16B37/06 . . by means of welding or riveting

F16B37/06A . . . [N: by means of welding]

F16B37/06B . . . [N: by means of riveting]

F16B37/06B1 . . . . [N: with the use of separate rivets]

F16B37/06B2 . . . . [N: by deforming the material of the nut]

F16B37/06B2B . . . . . [N: 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] [N1010]

F16B37/06B4 . . . . [N: by deforming the material of the support, e.g. the sheet or plate]

F16B37/08 . Quickly-detachable [N: or mountable] nuts, e.g. consisting of two or more parts ; Nuts movable along the bolt after tilting the nut [N: not used, see subgroups] [C9412]

F16B37/08A . . [N: Nuts engaged from the end of the bolt, e.g. axially slidable nuts] [N9412]

F16B37/08A2 . . . [N: movable along the bolt after tilting the nut] [N9412]

F16B37/08A4 . . . [N: in two halves pivotally connected] [N9412]

F16B37/08A6 . . . [N: with a longitudinal slit through the annular wall of the nut for enabling expansion of the nut, e.g. for easy removal] [N9412]

F16B37/08A8 . . . [N: with balls engaging threads or grooves on the shaft of the bolt] [N9412]

F16B37/08A10 . . . [N: fastened to the threaded bolt with snap-on-action, e.g. push-on nuts for stud bolts (F16B37/08A14 takes precedence; snap-on-action of a pin, spigot, shaft or the like and a member surrounding it F16B21/06)] [N9412]

F16B37/08A12 . . . [N: with at least one unthreaded portion in both the nut and the bolt] [N9412]

F16B37/08A14 . . . [N: 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 (F16B37/08A4 and F16B37/08A8 take precedence)] [N9412]

F16B37/08A16 . . . [N: 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 (F16B37/08A8 takes precedence)] [N9412]

F16B37/08L . . [N: engaging the bolt laterally, i.e. without the need to engage the end of the bolt] [N9412]

F16B37/08L2 . . . [N: in one piece, e.g. C-shaped nuts] [N9412]

F16B37/08L4 . . . [N: in two halves hingedly connected] [N9412]

F16B37/08L6 . . . [N: in two or more pieces, e.g. assemblies made by two C-shaped nuts mutually interlocked, or retained by an additional member (F16B37/08L4 takes precedence)] [N9412]

F16B37/12 . 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 [N: Mounting devices B25B27/14B]

F16B37/12B . . [N: Threaded inserts, e.g. "rampa bolts"]

F16B37/12B2 . . . [N: the external surface of the insert being threaded] [N9803]

F16B37/12B2B . . . . [N: and self-tapping] [N9803]

F16B37/14 . Cap nuts; Nut caps or bolt caps

F16B37/14S . . [N: Sleeve nuts, e.g. combined with bolts]

F16B37/16 . Wing-nuts (F16B37/14 takes precedence)

**F16B39/00** **Locking of screws, bolts or nuts** ([N: F16B35/00B takes precedence]; locking of bottle closures B65D; locking of rail-fastening bolts for permanent ways E01B9/12; locking of fastening means for railway fishplates E01B11/38; 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.

F16B39/01 . specially adapted to prevent loosening at extreme temperatures

F16B39/02 . in which the locking takes place after screwing down (F16B39/01 takes precedence; split-pins, circlips, or the like for preventing relative axial movement only F16B21/10; fastening nuts by welding or riveting F16B37/06)

F16B39/02B . . [N: by injecting a settable material after the screwing down]

F16B39/02E . . [N: by driving a conic or wedge-shaped expander through the threaded element] [N9411]

F16B39/02P . . [N: by plastic deformation of a part of one of the threaded elements into a notch or cavity of the other threaded element (F16B39/10C and F16B39/10D take precedence)] [N9702]

F16B39/02S . . [N: by swaging the nut on the bolt, i.e. by plastically deforming the nut] [N9604]

F16B39/02T . . [N: by means of an auxiliary bolt or threaded element whose action provokes the deformation of the main bolt or nut and thereby its blocking] [N9604]

F16B39/04 . . with a member penetrating the screw-threaded surface of at least one part, e.g. a pin, a wedge, cotter-pin, screw

F16B39/06 . . . with a pin or staple parallel to the bolt axis

F16B39/08 . . with a cap interacting with the nut, connected to the bolt by a pin or cotter pin

F16B39/10 . . by a plate, [N: spring, wire] or ring immovable with regard to the bolt or object [N: and mainly perpendicular to the axis of the bolt] (F16B39/08 takes precedence) [C9509]

F16B39/10A . . . [N: with a plate, spring, wire or ring holding two or more nuts or bolt heads which are mainly in the same plane] [N9509]

F16B39/10C . . . [N: 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] [N9603]

F16B39/10C2 . . . . [N: 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] [N9603]

F16B39/10D . . . [N: 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] [N9603]

F16B39/10W . . . [N: 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 (F16B39/10C takes precedence)] [N9603]

F16B39/12 . . by means of locknuts

F16B39/12B . . . [N: foreseen with mating surfaces inclined, i.e. not normal, to the bolt axis]

F16B39/12B2 . . . . [N: with helically inclined mating surfaces]

F16B39/12C . . . [N: causing radial forces on the bolt-shaft (F16B39/36 takes precedence)]

F16B39/12C2 . . . . [N: by means of eccentrical or spiral interengaging parts]

F16B39/14 . . . made of thin sheet material or formed as spring-washers (locknuts per se made of thin sheet metal F16B37/02)

F16B39/16 . . . in which the screw-thread of the locknut differs from that of the nut

F16B39/18 . . . . in which the locknut grips with screw-thread in the nuts as well as on the bolt

F16B39/20 . . by means of steel wire or the like (F16B39/10 takes precedence)

F16B39/22 . in which the locking takes place during screwing down or tightening (F16B39/01 takes precedence)

F16B39/22B . . [N: by means of a settable material]

F16B39/24 . . by means of washers, spring washers, or resilient plates that lock against the object (locking to the screw-thread F16B39/14, [N: F16B39/34], F16B39/36) [C9604]

F16B39/26 . . . with spring washers fastened to the nut or bolt-head

F16B39/28 . . by special members on, or shape of, the nut or bolt (F16B39/26 takes precedence; locknuts F16B39/12)

F16B39/282 . . . Locking by means of special shape of work-engaging surfaces, e.g. notched or toothed nuts

F16B39/282B . . . . [N: causing the bolt to tilt]

F16B39/284 . . . Locking by means of elastic deformation ([N: F16B39/282B, F16B39/36,] F16B39/38 take precedence)

F16B39/286 . . . . caused by saw cuts

F16B39/30 . . . Locking exclusively by special shape of the screw-thread

F16B39/32 . . . Locking by means of a pawl or pawl-like tongue

F16B39/34 . . . Locking by deformable inserts or like parts

F16B39/36 . . . with conical locking parts, which may be split, including use of separate rings co-operating therewith

F16B39/38 . . . with a second part of the screw-thread which may be resiliently mounted (F16B39/30 takes precedence)

**F16B41/00** **Measures against loss of bolts, nuts, or pins; Measures against unauthorised operation of bolts, nuts or pins** ([N: locking of screws, bolts or nuts F16B39/00;] seals

G09F3/00)

F16B41/00B . [N: Measures against loss of bolts, nuts or pins (devices for fastening nuts to surfaces F16B37/04)]

F16B41/00C . [N: Measures against unauthorised operation of bolts, nuts or pins (F16B23/00B, F16B23/00E, F16B23/00P, F16B23/00S and F16B31/02 take precedence; locks, keys E05B; for valves, taps or cocks F16K35/00; for pipe-joints with swivel-nuts F16L19/00B)]

F16B41/00C2 . . [N: by means of two housings hingedly connected which enclose the bolt head] [N9702]

**F16B43/00** **Washers or equivalent devices; Other devices for supporting bolt-heads or nuts** (circlips F16B21/18; [N: for indicating tensile load F16B31/02; forming a whole with the bolt or nut F16B33/00; locking bolts or nuts by means of a fixed plate or ring, or washer-like resilient plates F16B39/10, F16B39/24]) [C9604]

F16B43/00B . [N: for sealing or insulation]

F16B43/00F . [N: with special provisions for reducing friction] [N9412]

F16B43/00H . [N: with a special hole shape in order to allow a quick mounting or dismounting of the washer, e.g. with a keyhole slot (F16B43/00L takes precedence)] [N9601]

F16B43/00K . [N: with a radial cut in order to improve elasticity of the washer (F16B43/00L takes precedence)] [N9601]

F16B43/00L . [N: 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 (F16B43/00W takes precedence)] [N9601]

F16B43/00L4 . . [N: in two or more parts hingedly connected] [N9601]

F16B43/00L6 . . [N: in two or more parts] [N9601] [C9604]

F16B43/00W . [N: with a wedging effect in order to adjust the height of the washer] [N9601]

F16B43/02 . with special provisions for engaging surfaces which are not perpendicular to a bolt axis or do not surround the bolt

F16B43/02B . . [N: for surfaces not surrounding the bolt, e.g. hook adaptors for bolts]

**F16B45/00** **Hooks; Eyes** (if the attaching parts or means are concerned, groups F16B13/00, F16B15/00, F16B19/00, F16B25/00, F16B35/00, F16B47/00 take precedence; for hanging pictures or the like A47G1/16; towing hooks for ships B63B21/58; for hoisting or hauling purposes B66C; hooks or eyes with integral parts designed to facilitate quick attachment to cables or ropes at any point F16G11/14)

F16B45/02 . Hooks with a pivoting [N: or elastically bending] closing member

F16B45/02R . . [N: manoeuvrable remotely with a cable, chain, rod or the like] [N9505]

F16B45/04 . Hooks with a sliding closing member

F16B45/06 . Hooks with two symmetrically-pivoting hook parts

**F16B47/00** **Suction cups for attaching purposes; Equivalent means using adhesives** [N: (devices using adhesives, suction or magnetism for hanging or supporting pictures or the like A47G1/17; vacuum work holders B25B11/00C; anchoring of ships using suction B63B21/27; suction cups for handling glass B65G49/06B; load-engaging elements for cranes using suction means B66C1/02)]

F16B47/00B . [N: using adhesives for attaching purposes (using adhesives for connecting constructional elements F16B11/00F)]

F16B47/00L . [N: the suction cups being activated by the rotation of a cranked lever arm] [N9510]