| Symbol | Typ | Titel |
|---|---|---|
| **E** | **Sektion** | **SECTION E — FIXED CONSTRUCTIONS** |
| **E21** | **Untersektion** | **EARTH OR ROCK DRILLING; MINING** |
| **E21** | **Klasse** | **EARTH OR ROCK DRILLING; MINING** |
| **E21B** | **Unterklasse** | **EARTH OR ROCK DRILLING (mining, quarrying E21C; making shafts, driving galleries or tunnels E21D); OBTAINING OIL, GAS, WATER, SOLUBLE OR MELTABLE MATERIALS OR A SLURRY OF MINERALS FROM WELLS [5]** |
| | | **Methods or apparatus for drilling** |
| **E21B 1/00** | **Hauptgruppe** | **Percussion drilling (drives used in the borehole E21B 4/00) [3]** |
| E21B 1/02 | 1-Punkt Untergruppe | . Surface drives for drop hammers, e.g. with a cable [1, 7] |
| E21B 1/04 | 2-Punkt Untergruppe | . . Devices for reversing the movement of the rod or cable at the surface |
| E21B 1/12 | 1-Punkt Untergruppe | . with a reciprocating impulse member (E21B 1/02, E21B 1/38 take precedence) [7] |
| E21B 1/14 | 2-Punkt Untergruppe | . . driven by a rotating mechanism [7] |
| E21B 1/16 | 3-Punkt Untergruppe | . . . with spring-mounted reciprocating masses, e.g. with air cushion [7] |
| E21B 1/18 | 4-Punkt Untergruppe | . . . . with elastic joining of the drive to the push-rod by double buffer springs [7] |
| E21B 1/20 | 3-Punkt Untergruppe | . . . formed as centrifugal hammers [7] |
| E21B 1/22 | 2-Punkt Untergruppe | . . driven by electromagnets [7] |
| E21B 1/24 | 2-Punkt Untergruppe | . . the impulse member being a piston driven directly by fluid pressure [7] |
| E21B 1/26 | 3-Punkt Untergruppe | . . . by liquid pressure [7] |
| E21B 1/28 | 4-Punkt Untergruppe | . . . . working with pulses [7] |
| E21B 1/30 | 3-Punkt Untergruppe | . . . by air, steam or gas pressure [7] |
| E21B 1/32 | 4-Punkt Untergruppe | . . . . working with pulses [7] |
| E21B 1/34 | 5-Punkt Untergruppe | . . . . . the impulse member being a piston of an internal-combustion engine [7] |
| E21B 1/36 | 1-Punkt Untergruppe | . Tool-carrier piston type, i.e. in which the tool is connected to an impulse member [7] |
| E21B 1/38 | 1-Punkt Untergruppe | . Hammer piston type, i.e. in which the tool bit or anvil is hit by an impulse member [7] |
| **E21B 3/00** | **Hauptgruppe** | **Rotary drilling (drives used in the borehole E21B 4/00; rotary drilling machines in general B23B) [3]** |
| E21B 3/02 | 1-Punkt Untergruppe | . Surface drives for rotary drilling |
| E21B 3/025 | 2-Punkt Untergruppe | . . with a to-and-fro rotation of the tool [7] |
| E21B 3/03 | 2-Punkt Untergruppe | . . with an intermittent unidirectional rotation of the tool [7] |
| E21B 3/035 | 2-Punkt Untergruppe | . . with slipping or elastic transmission [7] |
| E21B 3/04 | 2-Punkt Untergruppe | . . Rotary tables |
| E21B 3/06 | 3-Punkt Untergruppe | . . . Adaptation of rotary draw works to drive rotary tables (connecting or disconnecting couplings or joints E21B 19/16; rope, cable, or chain winding mechanisms, capstans B66D) [3] |
| **E21B 4/00** | **Hauptgruppe** | **Drives used in the borehole [3]** |
| E21B 4/02 | 1-Punkt Untergruppe | . Fluid rotary type drives (hydraulic turbines for drilling wells F03B 13/02) [3] |

| Symbol | Typ | Titel |
|---|---|---|
| E21B 4/04 | 1-Punkt Untergruppe | . Electric drives (E21B 4/12 takes precedence) [3] |
| E21B 4/06 | 1-Punkt Untergruppe | . Down-hole impacting means, e.g. hammers (percussion drill bits E21B 10/36; boring rams E21B 11/02; releasing-jars E21B 31/107) [3] |
| E21B 4/08 | 2-Punkt Untergruppe | . . impact being obtained by gravity only, e.g. with lost-motion connection [3] |
| E21B 4/10 | 2-Punkt Untergruppe | . . continuous unidirectional rotary motion of shaft or drilling pipe effecting consecutive impacts [3] |
| E21B 4/12 | 2-Punkt Untergruppe | . . Electrically operated hammers [3] |
| E21B 4/14 | 2-Punkt Untergruppe | . . Fluid operated hammers [3] |
| E21B 4/16 | 1-Punkt Untergruppe | . Plural down-hole drives, e.g. for combined percussion and rotary drilling (E21B 4/10 takes precedence); Drives for multi-bit drilling units [3] |
| E21B 4/18 | 1-Punkt Untergruppe | . Anchoring or feeding in the borehole [3, 7] |
| E21B 4/20 | 1-Punkt Untergruppe | . combined with surface drive (E21B 4/10 takes precedence) [3] |
| **E21B 6/00** | **Hauptgruppe** | **Drives for drilling with combined rotary and percussive action (drives used in the borehole E21B 4/00; portable percussive machines with superimposed rotation B25D 16/00) [3]** |
| E21B 6/02 | 1-Punkt Untergruppe | . the rotation being continuous [7] |
| E21B 6/04 | 2-Punkt Untergruppe | . . Separate drives for percussion and rotation [7] |
| E21B 6/06 | 1-Punkt Untergruppe | . the rotation being intermittent, e.g. obtained by a ratchet device [7] |
| E21B 6/08 | 2-Punkt Untergruppe | . . Separate drives for percussion and rotation [7] |
| **E21B 7/00** | **Hauptgruppe** | **Special methods or apparatus for drilling (supports for the drilling machine, e.g. derricks or masts, E21B 15/00) [1, 7]** |
| E21B 7/02 | 1-Punkt Untergruppe | . Drilling rigs characterised by means for land transport, e.g. skid mounting or wheel mounting (portable drilling rigs for use on underwater floors E21B 7/124) [1, 7] |
| E21B 7/04 | 1-Punkt Untergruppe | . Directional drilling |
| E21B 7/06 | 2-Punkt Untergruppe | . . Deflecting the direction of boreholes |
| E21B 7/08 | 3-Punkt Untergruppe | . . . Special apparatus for deflecting the boring, e.g. special drill bits, knuckle joints, whipstocks (directional window cutting E21B 29/06; deflecting the direction of fishing tools E21B 31/14) |
| E21B 7/10 | 2-Punkt Untergruppe | . . Correction of deflected boreholes |
| E21B 7/12 | 1-Punkt Untergruppe | . Underwater drilling (telescoping joints E21B 17/07; using heave compensators E21B 19/09; well heads specially adapted for underwater installations E21B 33/035) [1, 7] |
| E21B 7/124 | 2-Punkt Untergruppe | . . with underwater tool drive prime mover, e.g. portable drilling rigs for use on underwater floors [3] |
| E21B 7/128 | 2-Punkt Untergruppe | . . from floating support with independent underwater anchored guide base [3] |
| E21B 7/132 | 2-Punkt Untergruppe | . . from underwater buoyant support [3] |
| E21B 7/136 | 2-Punkt Untergruppe | . . from non-buoyant support (E21B 7/124 takes precedence) [3] |
| E21B 7/14 | 1-Punkt Untergruppe | . Drilling by use of heat, e.g. flame drilling |
| E21B 7/15 | 2-Punkt Untergruppe | . . of electrically generated heat [3] |
| E21B 7/16 | 1-Punkt Untergruppe | . Applying separate balls or pellets by the pressure of the drill, so-called shot-drilling |
| E21B 7/18 | 1-Punkt Untergruppe | . Drilling by liquid or gas jets, with or without entrained pellets (E21B 7/14 takes precedence; hydraulic monitors E21C 45/00) [5] |

| Symbol | Typ | Titel |
|---|---|---|
| E21B 7/20 | 1-Punkt Untergruppe | . Driving or forcing casings or pipes into boreholes, e.g. sinking; Simultaneously drilling and casing boreholes ( surface means for applying to-and-fro rotation movements to the casing E21B 3/025; placing piles E02D 7/00; sinking shafts while moving the lining downwards E21D 1/08) [3] |
| E21B 7/24 | 1-Punkt Untergruppe | . Drilling using vibrating or oscillating means, e.g. out-of-balance masses (percussion drilling E21B 1/00) [3] |
| E21B 7/26 | 1-Punkt Untergruppe | . Drilling without earth removal, e.g. with self-propelled burrowing devices (E21B 7/30 takes precedence; down-hole drives E21B 4/00) [3, 6] |
| E21B 7/28 | 1-Punkt Untergruppe | . Enlarging drilled holes, e.g. by counterboring (drill bits for enlarging the borehole E21B 10/26) [3] |
| E21B 7/30 | 2-Punkt Untergruppe | . . without earth removal [6] |
| | | **Drilling tools** |
| ***E21B 10/00*** | ***Hauptgruppe*** | ***Drill bits ( specially adapted for deflecting the direction of boring E21B 7/08 ; with means for collecting substances E21B 27/00 ) [3, 2006.01]*** |
| E21B 10/02 | 1-Punkt Untergruppe | . Core bits (characterised by wear resisting parts E21B 10/46; obtaining undisturbed cores E21B 25/00) [3] |
| E21B 10/04 | 2-Punkt Untergruppe | . . with core destroying means [3] |
| E21B 10/06 | 2-Punkt Untergruppe | . . Roller core bits [3] |
| E21B 10/08 | 1-Punkt Untergruppe | . Roller bits (roller core bits E21B 10/06; with leading portion E21B 10/26; characterised by wear resisting parts E21B 10/46) [3] |
| E21B 10/10 | 2-Punkt Untergruppe | . . with roller axle supported at both ends (with disc cutters E21B 10/12) [3] |
| E21B 10/12 | 2-Punkt Untergruppe | . . with disc cutters [3] |
| E21B 10/14 | 2-Punkt Untergruppe | . . combined with non-rolling cutters other than of leading-portion type [3] |
| E21B 10/16 | 2-Punkt Untergruppe | . . characterised by tooth form or arrangement [3] |
| *E21B 10/18* | *2-Punkt Untergruppe* | *. . characterised by conduits or nozzles for drilling fluids ( drilling fluid supply to the bearings E21B 10/23 ) [3, 2006.01]* |
| E21B 10/20 | 2-Punkt Untergruppe | . . characterised by detachable or adjustable parts, e.g. legs or axles (cross axle roller bits E21B 10/10) [3] |
| *E21B 10/22* | *2-Punkt Untergruppe* | *. . characterised by bearing, lubrication or sealing details [3, 2006.01]* |
| *E21B 10/23* | *3-Punkt Untergruppe* | *. . . with drilling fluid supply to the bearings [2006.01]* |
| *E21B 10/24* | *3-Punkt Untergruppe* | *. . . characterised by lubricating details ( E21B 10/23 takes precedence ) [3, 2006.01]* |
| *E21B 10/25* | *3-Punkt Untergruppe* | *. . . characterised by sealing details [2006.01]* |
| E21B 10/26 | 1-Punkt Untergruppe | . Drill bits with leading portion, i.e. drill bits with a pilot cutter; Drill bits for enlarging the borehole, e.g. reamers (percussion drill bits with leading portion E21B 10/40; augers with leading portion E21B 10/44) [3] |
| E21B 10/28 | 2-Punkt Untergruppe | . . with non-expansible roller cutters [3] |
| E21B 10/30 | 3-Punkt Untergruppe | . . . Longitudinal axis roller reamers, e.g. reamer stabilisers [3] |
| E21B 10/32 | 2-Punkt Untergruppe | . . with expansible cutting tools [3] |
| E21B 10/34 | 3-Punkt Untergruppe | . . . of roller-cutter type [3] |
| E21B 10/36 | 1-Punkt Untergruppe | . Percussion drill bits (characterised by wear resisting parts E21B 10/46) [3] |
| E21B 10/38 | 2-Punkt Untergruppe | . . characterised by conduits or nozzles for drilling fluids [3] |
| E21B 10/40 | 2-Punkt Untergruppe | . . with leading portion [3] |

| Symbol | Typ | Titel |
|---|---|---|
| *E21B 10/42* | *1-Punkt Untergruppe* | *. Rotary drag type drill bits with teeth, blades or like cutting elements, e.g. fork-type bits, fish tail bits ( characterised by wear resisting parts E21B 10/46 , by conduits or nozzles for drilling fluid E21B 10/60 , by detachable parts E21B 10/62 ) [3, 2006.01]* |
| *E21B 10/43* | *2-Punkt Untergruppe* | *. . characterised by the arrangement of teeth or other cutting elements [2006.01]* |
| *E21B 10/44* | *1-Punkt Untergruppe* | *. Bits with helical conveying portion, e.g. screw type bits ; Augers with leading portion or with detachable parts ( E21B 10/42 takes precedence ; drilling rods with helical structure E21B 17/22 ) [3, 2006.01]* |
| E21B 10/46 | 1-Punkt Untergruppe | . characterised by wear resisting parts, e.g. diamond inserts [3] |
| E21B 10/48 | 2-Punkt Untergruppe | . . the bit being of core type [3] |
| E21B 10/50 | 2-Punkt Untergruppe | . . the bit being of roller type [3] |
| E21B 10/52 | 3-Punkt Untergruppe | . . . with chisel- or button-type inserts [3] |
| *E21B 10/54* | *2-Punkt Untergruppe* | *. . the bit being of the rotary drag type, e.g. fork-type bits [3, 2006.01]* |
| *E21B 10/55* | *3-Punkt Untergruppe* | *. . . with preformed cutting elements ( inserts per se E21B 10/56 , E21B 10/58 ) [2006.01]* |
| E21B 10/56 | 2-Punkt Untergruppe | . . Button-type inserts (E21B 10/52 takes precedence) [3] |
| *E21B 10/567* | *3-Punkt Untergruppe* | *. . . with preformed cutting elements mounted on a distinct support, e.g. polycrystalline inserts [2006.01]* |
| *E21B 10/573* | *4-Punkt Untergruppe* | *. . . . characterised by support details, e.g. the substrate construction or the interface between the substrate and the cutting element [2006.01]* |
| E21B 10/58 | 2-Punkt Untergruppe | . . Chisel-type inserts (E21B 10/52, E21B 10/54 take precedence) [3] |
| E21B 10/60 | 1-Punkt Untergruppe | . characterised by conduits or nozzles for drilling fluids (for roller bits E21B 10/18; for percussion drill bits E21B 10/38) [3] |
| *E21B 10/61* | *2-Punkt Untergruppe* | *. . characterised by nozzle structure [2006.01]* |
| *E21B 10/62* | *1-Punkt Untergruppe* | *. characterised by parts, e.g. cutting elements, which are detachable or adjustable ( E21B 10/64 takes precedence ; for roller bits E21B 10/20 ; for augers E21B 10/44 ) [3, 2006.01]* |
| *E21B 10/627* | *2-Punkt Untergruppe* | *. . with plural detachable cutting elements [2006.01]* |
| *E21B 10/633* | *3-Punkt Untergruppe* | *. . . independently detachable [2006.01]* |
| E21B 10/64 | 1-Punkt Untergruppe | . characterised by the whole or part thereof being insertable into or removable from the borehole without withdrawing the drilling pipe (retrievable core receivers E21B 25/02) [3] |
| E21B 10/66 | 2-Punkt Untergruppe | . . the cutting element being movable through the drilling pipe and laterally shiftable [3] |
| **E21B 11/00** | **Hauptgruppe** | **Other drilling tools** |
| E21B 11/02 | 1-Punkt Untergruppe | . Boring rams (percussion drives used in the borehole E21B 4/06; percussion drill bits E21B 10/36) |
| E21B 11/04 | 1-Punkt Untergruppe | . Boring grabs |
| E21B 11/06 | 1-Punkt Untergruppe | . with driven cutting chains or similarly-driven tools |
| **E21B 12/00** | **Hauptgruppe** | **Accessories for drilling tools [3]** |
| E21B 12/02 | 1-Punkt Untergruppe | . Wear indicators [3] |
| E21B 12/04 | 1-Punkt Untergruppe | . Drill bit protectors [3] |
| E21B 12/06 | 1-Punkt Untergruppe | . Mechanical cleaning devices [3] |
| | | **Other equipment or details for drilling; Well equipment or well maintenance** |
| **E21B 15/00** | **Hauptgruppe** | **Supports for the drilling machine, e.g. derricks or masts [1, 7]** |

| Symbol | Typ | Titel |
|---|---|---|
| E21B 15/02 | 1-Punkt Untergruppe | . specially adapted for underwater drilling (E21B 15/04 takes precedence; floating drilling platforms B63B 35/44; drilling platforms on legs E02B 17/00) [3] |
| E21B 15/04 | 1-Punkt Untergruppe | . specially adapted for directional drilling, e.g. slant hole rigs [3] |
| **E21B 17/00** | **Hauptgruppe** | **Drilling rods or pipes; Flexible drill strings; Kellies; Drill collars; Sucker rods; Casings; Tubings ( rod couplings in general F16D; tubes or tube couplings in general F16L)** |
| E21B 17/01 | 1-Punkt Untergruppe | . Risers (riser connectors E21B 33/038) [3] |
| E21B 17/02 | 1-Punkt Untergruppe | . Couplings; Joints |
| E21B 17/03 | 2-Punkt Untergruppe | . . between drilling rod or pipe and drill motor, e.g. between drilling rod and hammer [7] |
| E21B 17/04 | 2-Punkt Untergruppe | . . between rod and bit, or between rod and rod |
| E21B 17/042 | 3-Punkt Untergruppe | . . . threaded |
| E21B 17/043 | 4-Punkt Untergruppe | . . . . with locking means |
| E21B 17/046 | 3-Punkt Untergruppe | . . . with ribs, pins, or jaws, and complementary grooves or the like, e.g. bayonet catches |
| E21B 17/05 | 3-Punkt Untergruppe | . . . Swivel joints |
| E21B 17/06 | 3-Punkt Untergruppe | . . . Releasing-joints, e.g. safety joints |
| E21B 17/07 | 3-Punkt Untergruppe | . . . Telescoping joints for varying drill string lengths; Shock absorbers (heave compensators in the derrick E21B 19/09; releasing-jars E21B 31/107) [3] |
| E21B 17/08 | 2-Punkt Untergruppe | . . Casing joints |
| E21B 17/10 | 1-Punkt Untergruppe | . Wear protectors; Centralising devices (drives used in the borehole with anchoring means E21B 4/18; guiding or centralising devices outside the borehole E21B 19/24) |
| E21B 17/12 | 2-Punkt Untergruppe | . . Devices for placing or drawing out wear protectors |
| E21B 17/14 | 1-Punkt Untergruppe | . Casing shoes |
| E21B 17/16 | 1-Punkt Untergruppe | . Drill collars [3] |
| E21B 17/18 | 1-Punkt Untergruppe | . Pipes provided with plural fluid passages (circulation of drilling fluid by means of such pipes E21B 21/12) [3] |
| E21B 17/20 | 1-Punkt Untergruppe | . Flexible or articulated drilling pipes [3] |
| E21B 17/22 | 1-Punkt Untergruppe | . Rods or pipes with helical structure (drill bits with helical conveying portion E21B 10/44) [3] |
| **E21B 19/00** | **Hauptgruppe** | **Handling rods, casings, tubes or the like outside the borehole, e.g. in the derrick; Apparatus for feeding the rods or cables (surface drives E21B 1/02, E21B 3/02)** |
| E21B 19/02 | 1-Punkt Untergruppe | . Rod or cable suspensions (load-engaging elements for hoisting or lowering purposes in general B66C 1/00; crown blocks or pulley blocks B66D; cable guides B66D 1/36) |
| E21B 19/04 | 2-Punkt Untergruppe | . . Hooks |
| E21B 19/06 | 2-Punkt Untergruppe | . . Elevators, i.e. rod- or tube-gripping devices |
| E21B 19/07 | 3-Punkt Untergruppe | . . . Slip-type elevators (slips in rotary tables E21B 19/10) |
| E21B 19/08 | 1-Punkt Untergruppe | . Apparatus for feeding the rods or cables (E21B 19/22 takes precedence; automatic feed E21B 44/02; hoisting drums B66D); Apparatus for increasing or decreasing the pressure on the drilling tool; Apparatus for counterbalancing the weight of the rods [3, 7] |
| E21B 19/081 | 2-Punkt Untergruppe | . . Screw-and-nut feed mechanisms [7] |
| E21B 19/083 | 2-Punkt Untergruppe | . . Cam, rack or like feed mechanisms [7] |

| Symbol | Typ | Titel |
|---|---|---|
| E21B 19/084 | 2-Punkt Untergruppe | . . with flexible drawing means, e.g. cables [7] |
| E21B 19/086 | 2-Punkt Untergruppe | . . with a fluid-actuated cylinder (E21B 19/084, E21B 19/087, E21B 19/09 take precedence) [7] |
| E21B 19/087 | 2-Punkt Untergruppe | . . by means of a swinging arm [7] |
| E21B 19/089 | 2-Punkt Untergruppe | . . with a spring or an additional weight [7] |
| E21B 19/09 | 2-Punkt Untergruppe | . . specially adapted for drilling underwater formations from a floating support using heave compensators supporting the drill string (drilling-pipe telescoping joints E21B 17/07) [3] |
| E21B 19/10 | 1-Punkt Untergruppe | . Slips; Spiders |
| E21B 19/12 | 1-Punkt Untergruppe | . Rope clamps (rope clamps in general F16G 11/00) |
| E21B 19/14 | 1-Punkt Untergruppe | . Racks, ramps, troughs or bins, for holding the lengths of rod singly or connected; Handling between storage place and borehole (E21B 19/20, E21B 19/22 take precedence) [3] |
| E21B 19/15 | 2-Punkt Untergruppe | . . Racking of rods in horizontal position; Handling between horizontal and vertical position [3] |
| E21B 19/16 | 1-Punkt Untergruppe | . Connecting or disconnecting pipe couplings or joints (E21B 19/20 takes precedence; pipe wrenches or the like B25B) [3] |
| E21B 19/18 | 1-Punkt Untergruppe | . Connecting or disconnecting drill bit and drilling pipe [3] |
| E21B 19/20 | 1-Punkt Untergruppe | . Combined feeding from rack and connecting, e.g. automatically [3] |
| E21B 19/22 | 1-Punkt Untergruppe | . Handling reeled pipe or rod units, e.g. flexible drilling pipes [3] |
| E21B 19/24 | 1-Punkt Untergruppe | . Guiding or centralising devices for drilling rods or pipes [7] |
| **E21B 21/00** | **Hauptgruppe** | **Methods or apparatus for flushing boreholes, e.g. by use of exhaust air from motor (freeing objects stuck in boreholes by flushing E21B 31/03; well drilling compositions C09K 8/02) [2, 7]** |
| E21B 21/01 | 1-Punkt Untergruppe | . Arrangements for handling drilling fluids or cuttings outside the borehole, e.g. mud boxes (arrangements for treating drilling fluids E21B 21/06) [7] |
| E21B 21/015 | 2-Punkt Untergruppe | . . Means engaging the bore entrance, e.g. hoods for collecting dust [7] |
| E21B 21/02 | 1-Punkt Untergruppe | . Swivel joints in hose lines |
| E21B 21/06 | 1-Punkt Untergruppe | . Arrangements for treating drilling fluids outside the borehole (treating steps per se, see the relevant subclasses) [3] |
| E21B 21/07 | 2-Punkt Untergruppe | . . for treating dust-laden gaseous fluids [7] |
| E21B 21/08 | 1-Punkt Untergruppe | . Controlling or monitoring pressure or flow of drilling fluid, e.g. automatic filling of boreholes, automatic control of bottom pressure (valve arrangements therefor E21B 21/10) [3] |
| E21B 21/10 | 1-Punkt Untergruppe | . Valves arrangements in drilling-fluid circulation systems (valves in general F16K) [3] |
| E21B 21/12 | 1-Punkt Untergruppe | . using drilling pipes with plural fluid passages, e.g. closed circulation systems (pipes with plural fluid passages E21B 17/18) [3] |
| E21B 21/14 | 1-Punkt Untergruppe | . using liquids and gases, e.g. foams [3] |
| E21B 21/16 | 1-Punkt Untergruppe | . using gaseous fluids (E21B 21/14 takes precedence; arrangements for handling drilling fluids outside the borehole E21B 21/01; arrangements for treating drilling fluids E21B 21/06) [7] |
| E21B 21/18 | 1-Punkt Untergruppe | . Preventing exhaust air from the drill motor from blowing-off towards the working face [7] |
| **E21B 23/00** | **Hauptgruppe** | **Apparatus for displacing, setting, locking, releasing or removing tools, packers or the like in boreholes or wells (setting of casings, screens, or liners E21B 43/10)** |

| Symbol | Typ | Titel |
|---|---|---|
| E21B 23/01 | 1-Punkt Untergruppe | . for anchoring the tools or the like (E21B 23/02-E21B 23/06 take precedence; anchoring of drives in the borehole E21B 4/18) [6] |
| E21B 23/02 | 1-Punkt Untergruppe | . for locking the tools or the like in landing nipples or in recesses between adjacent sections of tubing (E21B 23/03-E21B 23/06 take precedence) [3] |
| E21B 23/03 | 1-Punkt Untergruppe | . for setting the tools into, or removing the tools from, laterally offset landing nipples or pockets [3] |
| E21B 23/04 | 1-Punkt Untergruppe | . operated by fluid means, e.g. actuated by explosion (E21B 23/06, E21B 23/08 take precedence) [3] |
| E21B 23/06 | 1-Punkt Untergruppe | . for setting packers |
| E21B 23/08 | 1-Punkt Untergruppe | . Introducing or running tools by fluid pressure, e.g. through-the-flow-line tool systems (special provisions on heads therefor E21B 33/068; cementing plugs E21B 33/16; scrapers operated by fluid pressure E21B 37/04) [3] |
| E21B 23/10 | 2-Punkt Untergruppe | . . Tools specially adapted therefor [3] |
| E21B 23/12 | 2-Punkt Untergruppe | . . Tool diverters [3] |
| E21B 23/14 | 1-Punkt Untergruppe | . for displacing a cable or a cable-operated tool, e.g. for logging or perforating operations in deviated wells ( by fluid pressure E21B 23/08; provision on well heads for introducing or removing cable-operated tools E21B 33/072, E21B 33/076) [6] |
| **E21B 25/00** | **Hauptgruppe** | **Apparatus for obtaining or removing undisturbed cores, e.g. core barrels, core extractors (core bits E21B 10/02; using explosives or projectiles in boreholes E21B 49/04; side-wall sampling or coring E21B 49/06)** |
| E21B 25/02 | 1-Punkt Untergruppe | . the core receiver being insertable into, or removable from, the borehole without withdrawing the drilling pipe (retrievable drill bits E21B 10/64) [3] |
| E21B 25/04 | 2-Punkt Untergruppe | . . the core receiver having a core forming cutting edge or element, e.g. punch type core barrels [3] |
| E21B 25/06 | 1-Punkt Untergruppe | . the core receiver having a flexible liner or inflatable retaining means [3] |
| E21B 25/08 | 1-Punkt Untergruppe | . Coating, freezing, consolidating cores (E21B 25/06 takes precedence); Recovering uncontaminated cores or cores at formation pressure [3] |
| E21B 25/10 | 1-Punkt Untergruppe | . Formed core retaining or severing means (E21B 25/06, E21B 25/08 take precedence) [3] |
| E21B 25/12 | 2-Punkt Untergruppe | . . of the sliding wedge type [3] |
| E21B 25/14 | 2-Punkt Untergruppe | . . mounted on pivot transverse to core axis [3] |
| E21B 25/16 | 1-Punkt Untergruppe | . for obtaining oriented cores [3] |
| E21B 25/18 | 1-Punkt Untergruppe | . the core receiver being specially adapted for operation under water [3] |
| ***E21B 27/00*** | ***Hauptgruppe*** | ***Containers for collecting or depositing substances in boreholes or wells, e.g. bailers for collecting mud or sand ; Drill bits with means for collecting substances, e.g. valve drill bits [6, 2006.01]*** |
| *E21B 27/02* | *1-Punkt Untergruppe* | *. Dump bailers, i.e. containers for depositing substances, e.g. cement or acids [6, 2006.01]* |
| *E21B 27/04* | *1-Punkt Untergruppe* | *. where the collecting or depositing means include helical conveying means [2006.01]* |
| **E21B 28/00** | **Hauptgruppe** | **Vibration generating arrangements for boreholes or wells, e.g. for stimulating production (for drilling E21B 7/24; for transmitting measuring-signals E21B 47/14; for geophysical measurements G01V 1/02) [6]** |
| **E21B 29/00** | **Hauptgruppe** | **Cutting or destroying pipes, packers, plugs, or wire lines, located in boreholes or wells, e.g. cutting of damaged pipes, of windows (perforators E21B 43/11); Deforming of pipes in boreholes or wells; Reconditioning of well casings while in the ground** |
| E21B 29/02 | 1-Punkt Untergruppe | . by explosives or by thermal or chemical means (destroying objects in boreholes or wells by explosives E21B 31/16) |

| Symbol | Typ | Titel |
|---|---|---|
| E21B 29/04 | 1-Punkt Untergruppe | . Cutting of wire lines or the like (E21B 29/02 takes precedence) [3] |
| E21B 29/06 | 1-Punkt Untergruppe | . Cutting windows, e.g. directional window cutters for whipstock operations (E21B 29/08 takes precedence; whipstocks E21B 7/08) [3] |
| E21B 29/08 | 1-Punkt Untergruppe | . Cutting or deforming pipes to control fluid flow (blow-out preventers E21B 33/06) [3] |
| E21B 29/10 | 1-Punkt Untergruppe | . Reconditioning of well casings, e.g. straightening [3] |
| E21B 29/12 | 1-Punkt Untergruppe | . specially adapted for underwater installations (E21B 29/08 takes precedence) [3] |
| **E21B 31/00** | **Hauptgruppe** | **Fishing for or freeing objects in boreholes or wells (provisions on well heads for introducing or removing objects E21B 33/068; locating or determining the position of objects in boreholes or wells E21B 47/09)** |
| E21B 31/03 | 1-Punkt Untergruppe | . Freeing by flushing [3] |
| E21B 31/06 | 1-Punkt Untergruppe | . using magnetic means [3] |
| E21B 31/08 | 1-Punkt Untergruppe | . using junk baskets or the like [3] |
| E21B 31/107 | 1-Punkt Untergruppe | . using impact means for releasing stuck parts, e.g. jars (telescoping joints E21B 17/07) [3] |
| E21B 31/113 | 2-Punkt Untergruppe | . . hydraulically operated [3] |
| E21B 31/12 | 1-Punkt Untergruppe | . Grappling tools, e.g. tongs or grabs |
| E21B 31/14 | 2-Punkt Untergruppe | . . with means deflecting the direction of the tool, e.g. by use of knuckle joints (apparatus for deflecting the boring E21B 7/08) [3] |
| E21B 31/16 | 2-Punkt Untergruppe | . . combined with cutting or destroying means (cutting or destroying means per seE21B 29/00) [3] |
| E21B 31/18 | 2-Punkt Untergruppe | . . gripping externally, e.g. overshot [3] |
| E21B 31/20 | 2-Punkt Untergruppe | . . gripping internally, e.g. fishing spears [3] |
| **E21B 33/00** | **Hauptgruppe** | **Sealing or packing boreholes or wells** |
| E21B 33/02 | 1-Punkt Untergruppe | . Surface sealing or packing |
| E21B 33/03 | 2-Punkt Untergruppe | . . Well heads; Setting-up thereof (valve arrangements therefor E21B 34/02) |
| E21B 33/035 | 3-Punkt Untergruppe | . . . specially adapted for underwater installations (E21B 33/043, E21B 33/064, E21B 33/076 take precedence) [3] |
| E21B 33/037 | 4-Punkt Untergruppe | . . . . Protective housings therefor [3] |
| E21B 33/038 | 4-Punkt Untergruppe | . . . . Connectors used on well heads, e.g. for connecting blow-out preventer and riser (connecting a production flow line to an underwater well head E21B 43/013) [3] |
| E21B 33/04 | 3-Punkt Untergruppe | . . . Casing heads; Suspending casings or tubings in well heads (setting of casings in wells E21B 43/10) |
| E21B 33/043 | 4-Punkt Untergruppe | . . . . specially adapted for underwater well heads (E21B 33/047 takes precedence) [3] |
| E21B 33/047 | 4-Punkt Untergruppe | . . . . for plural tubing strings [3] |
| E21B 33/05 | 4-Punkt Untergruppe | . . . . Cementing-heads, e.g. having provision for introducing cementing plugs |
| E21B 33/06 | 3-Punkt Untergruppe | . . . Blow-out preventers [3] |
| E21B 33/064 | 4-Punkt Untergruppe | . . . . specially adapted for underwater well heads (connectors therefor E21B 33/038) [3] |
| E21B 33/068 | 3-Punkt Untergruppe | . . . having provision for introducing objects or fluids into, or removing objects from, wells (cementing-heads E21B 33/05) [3] |

| Symbol | Typ | Titel |
|---|---|---|
| E21B 33/072 | 4-Punkt Untergruppe | . . . . for cable-operated tools (E21B 33/076 takes precedence) [3] |
| E21B 33/076 | 4-Punkt Untergruppe | . . . . specially adapted for underwater installations [3] |
| E21B 33/08 | 2-Punkt Untergruppe | . . Wipers; Oil savers |
| E21B 33/10 | 1-Punkt Untergruppe | . in the borehole |
| E21B 33/12 | 2-Punkt Untergruppe | . . Packers; Plugs (used for cementing E21B 33/134, E21B 33/16) |
| E21B 33/122 | 3-Punkt Untergruppe | . . . Multiple-string packers |
| E21B 33/124 | 3-Punkt Untergruppe | . . . Units with longitudinally-spaced plugs for isolating the intermediate space |
| E21B 33/126 | 3-Punkt Untergruppe | . . . with fluid-pressure-operated elastic cup or skirt (E21B 33/122, E21B 33/124 take precedence) |
| E21B 33/127 | 3-Punkt Untergruppe | . . . with inflatable sleeve (E21B 33/122, E21B 33/124 take precedence) |
| E21B 33/128 | 3-Punkt Untergruppe | . . . with a member expanded radially by axial pressure (E21B 33/122, E21B 33/124 take precedence) |
| E21B 33/129 | 3-Punkt Untergruppe | . . . with mechanical slips for hooking into the casing (E21B 33/122, E21B 33/124 take precedence) |
| E21B 33/1295 | 4-Punkt Untergruppe | . . . . actuated by fluid pressure [6] |
| *E21B 33/13* | *2-Punkt Untergruppe* | *. . Methods or devices for cementing, for plugging holes, crevices, or the like ( dump bailers E21B 27/02 ; chemical compositions therefor C09K 8/00 ) [1, 2006.01]* |
| E21B 33/134 | 3-Punkt Untergruppe | . . . Bridging plugs |
| E21B 33/136 | 3-Punkt Untergruppe | . . . Baskets, e.g. of umbrella type |
| E21B 33/138 | 3-Punkt Untergruppe | . . . Plastering the borehole wall; Injecting into the formation |
| E21B 33/14 | 3-Punkt Untergruppe | . . . for cementing casings into boreholes |
| E21B 33/16 | 4-Punkt Untergruppe | . . . . using plugs for isolating cement charge; Plugs therefor |
| **E21B 34/00** | **Hauptgruppe** | **Valve arrangements for boreholes or wells (in drilling fluid circulation systems E21B 21/10; blow-out preventers E21B 33/06; oil flow regulating apparatus E21B 43/12; valves in general F16K) [3]** |
| E21B 34/02 | 1-Punkt Untergruppe | . in well heads [3] |
| E21B 34/04 | 2-Punkt Untergruppe | . . in underwater well heads [3] |
| E21B 34/06 | 1-Punkt Untergruppe | . in wells [3] |
| E21B 34/08 | 2-Punkt Untergruppe | . . responsive to flow or pressure of the fluid obtained (E21B 34/10 takes precedence) [3] |
| E21B 34/10 | 2-Punkt Untergruppe | . . operated by control fluid supplied from outside the borehole (control means being outside the borehole E21B 34/16) [3] |
| E21B 34/12 | 2-Punkt Untergruppe | . . operated by movement of casings or tubings [3] |
| E21B 34/14 | 2-Punkt Untergruppe | . . operated by movement of tools, e.g. sleeve valves operated by pistons or wire line tools [3] |
| E21B 34/16 | 1-Punkt Untergruppe | . Control means therefor being outside the borehole [3] |
| **E21B 35/00** | **Hauptgruppe** | **Methods or apparatus for preventing or extinguishing fires (cutting or deforming pipes to control fluid flow E21B 29/08; controlling flow of fluid to or in wells E21B 43/12; fire fighting in general A62C, A62D)** |
| **E21B 36/00** | **Hauptgruppe** | **Heating, cooling, or insulating arrangements for boreholes or wells, e.g. for use in permafrost zones (drilling by use of heat E21B 7/14; secondary recovery methods using heat E21B 43/24) [3]** |
| E21B 36/02 | 1-Punkt Untergruppe | . using burners [3] |

| Symbol | Typ | Titel |
|---|---|---|
| E21B 36/04 | 1-Punkt Untergruppe | . using electrical heaters [3] |
| **E21B 37/00** | **Hauptgruppe** | **Methods or apparatus for cleaning boreholes or wells (E21B 21/00 takes precedence; cleaning pipes in general B08B 9/02)** |
| E21B 37/02 | 1-Punkt Untergruppe | . Scrapers specially adapted therefor |
| E21B 37/04 | 2-Punkt Untergruppe | . . operated by fluid pressure, e.g. free-piston scrapers (operating other tools by fluid pressure E21B 23/08) [3] |
| *E21B 37/06* | *1-Punkt Untergruppe* | *. using chemical means for preventing or limiting the deposition of paraffins or like substances ( chemical compositions therefor C09K 8/52 ) [3, 2006.01]* |
| E21B 37/08 | 1-Punkt Untergruppe | . cleaning in situ of down-hole filters, screens, or gravel packs (E21B 37/06 takes precedence) [3] |
| E21B 37/10 | 1-Punkt Untergruppe | . Well swabs [3] |
| **E21B 40/00** | **Hauptgruppe** | **Tubing catchers, automatically arresting the fall of oil-well tubing** |
| **E21B 41/00** | **Hauptgruppe** | **Equipment or details not covered by groups E21B 15/00-E21B 40/00** |
| *E21B 41/02* | *1-Punkt Untergruppe* | *. in situ inhibition of corrosion in boreholes or wells ( dump bailers E21B 27/02 ; chemical compositions therefor C09K 8/54 ; inhibiting corrosion in general C23F ) [3, 6, 2006.01]* |
| E21B 41/04 | 1-Punkt Untergruppe | . Manipulators for underwater operations, e.g. temporarily connected to well heads (manipulators in general B25J) [3] |
| E21B 41/06 | 1-Punkt Untergruppe | . Work chambers for underwater operations, e.g. temporarily connected to well heads (in general B63C 11/00) [3] |
| E21B 41/08 | 1-Punkt Untergruppe | . Underwater guide bases, e.g. drilling templates; Levelling thereof [7] |
| E21B 41/10 | 1-Punkt Untergruppe | . Guide posts, e.g. releasable; Attaching guide lines to underwater guide bases [7] |
| | | **Obtaining fluids from wells [3]** |
| **E21B 43/00** | **Hauptgruppe** | **Methods or apparatus for obtaining oil, gas, water, soluble or meltable materials or a slurry of minerals from wells (applicable only to water E03B; obtaining oil-bearing deposits or soluble or meltable materials by mining techniques E21C 41/00; pumps F04)** |
| E21B 43/01 | 1-Punkt Untergruppe | . specially adapted for obtaining from underwater installations (underwater well heads E21B 33/035) |
| E21B 43/013 | 2-Punkt Untergruppe | . . Connecting a production flow line to an underwater well head [3] |
| E21B 43/017 | 2-Punkt Untergruppe | . . Production satellite stations, i.e. underwater installations comprising a plurality of satellite well heads connected to a central station (underwater separating arrangements E21B 43/36) [3] |
| *E21B 43/02* | *1-Punkt Untergruppe* | *. Subsoil filtering ( E21B 43/11 takes precedence ; chemical compositions for consolidating loose sand or the like around wells C09K 8/56 ) [1, 2006.01]* |
| E21B 43/04 | 2-Punkt Untergruppe | . . Gravelling of wells |
| E21B 43/08 | 2-Punkt Untergruppe | . . Screens or liners |
| E21B 43/10 | 2-Punkt Untergruppe | . . Setting of casings, screens or liners in wells (driving or forcing casings into boreholes, simultaneously drilling and casing boreholes E21B 7/20; setting of tools, packers or the like E21B 23/00; suspending casings in well heads E21B 33/04) |
| E21B 43/11 | 1-Punkt Untergruppe | . Perforators; Permeators |
| E21B 43/112 | 2-Punkt Untergruppe | . . Perforators with extendable perforating members, e.g. actuated by fluid means |
| E21B 43/114 | 2-Punkt Untergruppe | . . Perforators using direct fluid action, e.g. abrasive jets |
| E21B 43/116 | 2-Punkt Untergruppe | . . Gun or shaped-charge perforators |

| Symbol | Typ | Titel |
|---|---|---|
| E21B 43/117 | 3-Punkt Untergruppe | . . . Shaped-charge perforators (E21B 43/118 takes precedence) |
| E21B 43/118 | 3-Punkt Untergruppe | . . . characterised by lowering in vertical position and subsequent tilting to operating position |
| E21B 43/1185 | 3-Punkt Untergruppe | . . . Ignition systems [3] |
| E21B 43/119 | 2-Punkt Untergruppe | . . Details, e.g. for locating perforating place or direction |
| E21B 43/12 | 1-Punkt Untergruppe | . Methods or apparatus for controlling the flow of the obtained fluid to or in wells (E21B 43/25 takes precedence; valve arrangements E21B 34/00) |
| E21B 43/14 | 1-Punkt Untergruppe | . Obtaining from a multiple-zone well |
| E21B 43/16 | 1-Punkt Untergruppe | . Enhanced recovery methods for obtaining hydrocarbons (fracturing E21B 43/26; obtaining slurry E21B 43/29 ; reclamation of contaminated soil in situB09C) |
| E21B 43/17 | 2-Punkt Untergruppe | . . Interconnecting two or more wells by fracturing or otherwise attacking the formation (E21B 43/247 takes precedence) [3] |
| E21B 43/18 | 2-Punkt Untergruppe | . . Repressuring or vacuum methods |
| E21B 43/20 | 2-Punkt Untergruppe | . . Displacing by water |
| *E21B 43/22* | *2-Punkt Untergruppe* | *. . Use of chemicals or bacterial activity ( E21B 43/27 takes precedence ; chemical or bacterial compositions therefor C09K 8/58 ; chemical features in extracting oils from oil sands or shales C10G ) [1, 2006.01]* |
| E21B 43/24 | 2-Punkt Untergruppe | . . using heat, e.g. steam injection (heating, cooling or insulating wells E21B 36/00) |
| E21B 43/241 | 3-Punkt Untergruppe | . . . combined with solution mining of non-hydrocarbon minerals, e.g. solvent pyrolysis of oil shale [5] |
| E21B 43/243 | 3-Punkt Untergruppe | . . . Combustion in situ [3] |
| E21B 43/247 | 4-Punkt Untergruppe | . . . . in association with fracturing processes [3] |
| E21B 43/248 | 5-Punkt Untergruppe | . . . . . using explosives [5] |
| *E21B 43/25* | *1-Punkt Untergruppe* | *. Methods for stimulating production ( dump bailers E21B 27/02 ; vibration generating arrangements E21B 28/00 ; chemical compositions therefor C09K 8/60 ) [1, 2006.01]* |
| E21B 43/26 | 2-Punkt Untergruppe | . . by forming crevices or fractures |
| E21B 43/263 | 3-Punkt Untergruppe | . . . using explosives [3] |
| E21B 43/267 | 3-Punkt Untergruppe | . . . reinforcing fractures by propping [3] |
| E21B 43/27 | 3-Punkt Untergruppe | . . . by use of eroding chemicals, e.g. acids |
| E21B 43/28 | 1-Punkt Untergruppe | . Dissolving minerals other than hydrocarbons, e.g. by an alkaline or acid leaching agent (E21B 43/241 takes precedence) [5] |
| E21B 43/285 | 1-Punkt Untergruppe | . Melting minerals, e.g. sulfur (E21B 43/24 takes precedence; heating, cooling or insulating arrangements for wells E21B 36/00) [5] |
| E21B 43/29 | 1-Punkt Untergruppe | . Obtaining a slurry of minerals, e.g. by using nozzles [5] |
| E21B 43/295 | 1-Punkt Untergruppe | . Gasification of minerals, e.g. for producing mixtures of combustible gases (E21B 43/243 takes precedence) [5] |
| E21B 43/30 | 1-Punkt Untergruppe | . Specific pattern of wells, e.g. optimizing the spacing of wells (production satellite stations E21B 43/017) [3] |

| Symbol | Typ | Titel |
|---|---|---|
| E21B 43/32 | 1-Punkt Untergruppe | . Preventing gas- or water-coning phenomena, i.e. the formation of a conical column of gas or water around wells [3] |
| E21B 43/34 | 1-Punkt Untergruppe | . Arrangements for separating materials produced by the well (separating apparatus per se, see the relevant subclasses) [3] |
| E21B 43/36 | 2-Punkt Untergruppe | . . Underwater separating arrangements (E21B 43/38 takes precedence) [3] |
| E21B 43/38 | 2-Punkt Untergruppe | . . in the well [3] |
| E21B 43/40 | 2-Punkt Untergruppe | . . Separation associated with re-injection of separated materials [3] |
| | | **Automatic control; Surveying or testing [3]** |
| **E21B 44/00** | **Hauptgruppe** | **Automatic control systems specially adapted for drilling operations, i.e. self-operating systems which function to carry out or modify a drilling operation without intervention of a human operator, e.g. computer-controlled drilling systems (for non-automatic drilling control, see the operation controlled; automatic feeding from rack and connecting of drilling pipes E21B 19/20; controlling pressure or flow of drilling fluid E21B 21/08); Systems specially adapted for monitoring a plurality of drilling variables or conditions (means for transmitting measuring-signals from the well to the surface E21B 47/12) [3]** |
| E21B 44/02 | 1-Punkt Untergruppe | . Automatic control of the tool feed (E21B 44/10 takes precedence) [7] |
| E21B 44/04 | 2-Punkt Untergruppe | . . in response to the torque of the drive [7] |
| E21B 44/06 | 2-Punkt Untergruppe | . . in response to the flow or pressure of the motive fluid of the drive [7] |
| E21B 44/08 | 2-Punkt Untergruppe | . . in response to the amplitude of the movement of the percussion tool, e.g. jump or recoil [7] |
| E21B 44/10 | 1-Punkt Untergruppe | . Arrangements for automatic stopping when the tool is lifted from the working face [7] |
| | | **Surveying or testing** |
| **E21B 45/00** | **Hauptgruppe** | **Measuring the drilling time or rate of penetration** |
| **E21B 47/00** | **Hauptgruppe** | **Survey of boreholes or wells (monitoring pressure or flow of drilling fluid E21B 21/08; geophysical logging G01V)** |
| E21B 47/01 | 1-Punkt Untergruppe | . Devices for supporting measuring instruments on a drill pipe, rod or wireline (setting or locking tools in boreholes or wells E21B 23/00); Protecting measuring instruments in boreholes against heat, shock, pressure or the like [6] |
| E21B 47/02 | 1-Punkt Untergruppe | . Determining slope or direction (clinometers or direction meters G01C) |
| E21B 47/022 | 2-Punkt Untergruppe | . . of the borehole |
| E21B 47/024 | 2-Punkt Untergruppe | . . of devices in the borehole (E21B 47/022 takes precedence) |
| E21B 47/026 | 2-Punkt Untergruppe | . . of penetrated ground layers (apparatus for obtaining oriented cores E21B 25/16; formation testing E21B 49/00) |
| E21B 47/04 | 1-Punkt Untergruppe | . Measuring depth or liquid level (measuring liquid level in general G01F) |
| E21B 47/06 | 1-Punkt Untergruppe | . Measuring temperature or pressure (measuring temperature in general G01K; measuring pressure in general G01L) |
| E21B 47/08 | 1-Punkt Untergruppe | . Measuring diameter (measuring diameter in general G01B) |
| E21B 47/09 | 1-Punkt Untergruppe | . Locating or determining the position of objects in boreholes or wells; Identifying the free or blocked portions of pipes (measuring depth E21B 47/04; measuring diameter E21B 47/08) [3] |
| E21B 47/10 | 1-Punkt Untergruppe | . Locating fluid leaks, intrusions, or movements |
| E21B 47/12 | 1-Punkt Untergruppe | . Means for transmitting measuring-signals from the well to the surface, e.g. for logging while drilling (remote signalling in general G08) |

| Symbol | Typ | Titel |
|---|---|---|
| E21B 47/14 | 2-Punkt Untergruppe | . . using acoustic waves [6] |
| E21B 47/16 | 3-Punkt Untergruppe | . . . through the drill string or casing [6] |
| E21B 47/18 | 3-Punkt Untergruppe | . . . through the well fluid [6] |
| **E21B 49/00** | **Hauptgruppe** | **Testing the nature of borehole walls; Formation testing; Methods or apparatus for obtaining samples of soil or well fluids, specially adapted to earth drilling or wells (sampling in general G01N 1/00)** |
| E21B 49/02 | 1-Punkt Untergruppe | . by mechanically taking samples of the soil (apparatus for obtaining undisturbed cores E21B 25/00; investigation of foundation soil in situE02D 1/00) |
| E21B 49/04 | 2-Punkt Untergruppe | . . using explosives in boreholes; using projectiles penetrating the wall [3] |
| E21B 49/06 | 2-Punkt Untergruppe | . . using side-wall drilling tools or scrapers |
| E21B 49/08 | 1-Punkt Untergruppe | . Obtaining fluid samples or testing fluids, in boreholes or wells [3] |
| E21B 49/10 | 2-Punkt Untergruppe | . . using side-wall fluid samplers or testers [3] |