

Symbol	Typ	Titel
E	Sektion	FIXED CONSTRUCTIONS
E21	Untersektion	EARTH OR ROCK DRILLING; MINING
E21	Klasse	EARTH OR ROCK DRILLING; MINING
E21D	Unterklasse	SHAFTS; TUNNELS; GALLERIES; LARGE UNDERGROUND CHAMBERS (soil-conditioning or soil-stabilising materials C09K 17/00; cutting machines for mining or quarrying E21C; safety devices, transport, rescue, ventilation or drainage E21F) [2, 6]
		<u>Shafts</u>
E21D 1/00	Hauptgruppe	Sinking shafts
E21D 1/02	1-Punkt Untergruppe	. by hand
E21D 1/03	1-Punkt Untergruppe	. mechanically (E21D 1/08 takes precedence)
E21D 1/04	2-Punkt Untergruppe	. . with grabs
E21D 1/06	2-Punkt Untergruppe	. . with shaft-boring cutters (drilling machines E21B)
E21D 1/08	1-Punkt Untergruppe	. while moving the lining downwards
E21D 1/10	1-Punkt Untergruppe	. Preparation of the ground
E21D 1/12	2-Punkt Untergruppe	. . by freezing
E21D 1/14	3-Punkt Untergruppe	. . . Freezing apparatus
E21D 1/16	2-Punkt Untergruppe	. . by petrification (grouting anchoring-bolts E21D 20/02)
E21D 3/00	Hauptgruppe	Raising shafts, i.e. working upwards from the bottom
E21D 5/00	Hauptgruppe	Lining shafts; Linings therefor (E21D 11/00 takes precedence) [3]
E21D 5/01	1-Punkt Untergruppe	. using prefabricated lining lowered into a hole filled with liquid or viscous mass
E21D 5/012	1-Punkt Untergruppe	. Use of fluid-tight or anti-friction material on outside of, or between, lining layers
E21D 5/016	1-Punkt Untergruppe	. Bearer curbs
E21D 5/02	1-Punkt Untergruppe	. with wood (E21D 5/01 , E21D 5/012 , E21D 5/016 take precedence)
E21D 5/04	1-Punkt Untergruppe	. with brick, concrete, stone, or similar building materials (E21D 5/01 , E21D 5/012 , E21D 5/016 take precedence)
E21D 5/06	1-Punkt Untergruppe	. with iron or steel (E21D 5/01 , E21D 5/012 , E21D 5/016 take precedence)
E21D 5/08	2-Punkt Untergruppe	. . in the form of profiled parts
E21D 5/10	2-Punkt Untergruppe	. . in the form of tubing
E21D 5/11	1-Punkt Untergruppe	. with combinations of different materials, e.g. wood, metal, concrete (E21D 5/01 , E21D 5/012 , E21D 5/016 take precedence)
E21D 5/12	1-Punkt Untergruppe	. Accessories for making shaft linings, e.g. suspended cradles, shutterings
E21D 7/00	Hauptgruppe	Shaft equipment, e.g. timbering within the shaft
E21D 7/02	1-Punkt Untergruppe	. Arrangement of guides for cages in shafts; Connection of guides for cages to shaft walls (guideways or guides for elevators B66B 7/02)
		<u>Tunnels; Galleries; Large underground chambers; Linings therefor (galleries protecting against falling rocks or avalanches E01F 7/04; pressure galleries, galleries specially adapted to house pressure water conduits E02B 9/06; sewers E03F) [3, 6]</u>
E21D 9/00	Hauptgruppe	Tunnels or galleries, with or without linings; Methods or apparatus for making thereof (linings per

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se E21D 11/00); Layout of tunnels or galleries [3]		
E21D 9/01	1-Punkt Untergruppe	. <i>Methods or apparatus for enlarging or restoring the cross-section of tunnels, e.g. by restoring the floor to its original level [7]</i>
E21D 9/02	1-Punkt Untergruppe	. Driving inclined tunnels or galleries [3]
E21D 9/04	1-Punkt Untergruppe	. Driving tunnels or galleries through loose materials; Apparatus therefor not otherwise provided for
E21D 9/06	1-Punkt Untergruppe	. Making by using a driving shield [2]
E21D 9/08	2-Punkt Untergruppe	. . with additional boring or cutting means [2]
E21D 9/087	3-Punkt Untergruppe	. . . with a rotary drilling-head cutting simultaneously the whole cross-section, i.e. full-face machines [7]
E21D 9/093	2-Punkt Untergruppe	. . Control of the driving shield [7]
E21D 9/10	1-Punkt Untergruppe	. Making by using boring or cutting machines (E21D 9/08 takes precedence; similar machines for mining E21C 27/20; mining picks E21C 35/18) [3]
E21D 9/11	2-Punkt Untergruppe	. . with a rotary drilling-head cutting simultaneously the whole cross-section , i.e. full-face machines [7]
E21D 9/12	1-Punkt Untergruppe	. Devices for removing or hauling away excavated material or spoil; Working or loading platforms (underground transport E21F 13/00) [2]
E21D 9/13	2-Punkt Untergruppe	. . using hydraulic or pneumatic conveying means [7]
E21D 9/14	1-Punkt Untergruppe	. Layout of tunnels or galleries; Constructional features of tunnels or galleries, not otherwise provided for, e.g. portals, day-light attenuation at tunnel openings [3]
E21D 11/00	Hauptgruppe	Lining tunnels, galleries or other underground cavities, e.g. large underground chambers; Linings therefor; Making such linings in situ, e.g. by assembling (E21D 15/00 to E21D 23/00 take precedence; specially for shafts E21D 5/00; lining pressure water galleries, linings therefor E02B 9/06) [2]
E21D 11/02	1-Punkt Untergruppe	. Lining predominantly with wood [2]
E21D 11/03	2-Punkt Untergruppe	. . using timber-setting machines
E21D 11/04	1-Punkt Untergruppe	. Lining with building materials (E21D 11/02 , E21D 11/14 take precedence) [2]
E21D 11/05	2-Punkt Untergruppe	. . using compressible insertions
E21D 11/06	2-Punkt Untergruppe	. . with bricks
E21D 11/07	3-Punkt Untergruppe	. . . using brick-laying machines
E21D 11/08	2-Punkt Untergruppe	. . with preformed concrete slabs
E21D 11/10	2-Punkt Untergruppe	. . with concrete cast in situ; Shuttering or other equipment adapted therefor
E21D 11/12	2-Punkt Untergruppe	. . Temporary supports for use during building; Accessories
E21D 11/14	1-Punkt Untergruppe	. Lining predominantly with metal [2]
E21D 11/15	2-Punkt Untergruppe	. . Plate linings; Laggings, i.e. linings designed for holding back formation material or for transmitting the load to main supporting members (insulation E21D 11/38) [2]
E21D 11/18	2-Punkt Untergruppe	. . Arch members
E21D 11/20	3-Punkt Untergruppe	. . . Special cross-sections, e.g. corrugated
E21D 11/22	3-Punkt Untergruppe	. . . Clamps or other yieldable means for interconnecting adjacent arch members either rigidly, or allowing arch member parts to slide when subjected to excessive pressure

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E21D 11/24	3-Punkt Untergruppe	. . . Knuckle joints or links between arch members
E21D 11/26	3-Punkt Untergruppe	. . . Shoes for connecting arch members to longitudinal struts
E21D 11/28	2-Punkt Untergruppe	. . Longitudinal struts
E21D 11/30	2-Punkt Untergruppe	. . Bases for lower arch members (for props E21D 15/54)
E21D 11/34	2-Punkt Untergruppe	. . Joints between vertical props and horizontal top bars (end caps forming part of the props E21D 15/54)
E21D 11/36	2-Punkt Untergruppe	. . Linings or supports specially shaped for tunnels or galleries of irregular cross-section [2, 3]
E21D 11/38	1-Punkt Untergruppe	. Waterproofing (in general E02D 31/00); Heat insulating; Soundproofing; Electric insulating (for building constructions in general E04B 1/62) [2]
E21D 11/40	1-Punkt Untergruppe	. Devices or apparatus specially adapted for handling or placing units of linings for tunnels or galleries [2]
E21D 13/00	Hauptgruppe	Large underground chambers; Methods or apparatus for making them (lining E21D 11/00) [6]
E21D 13/02	1-Punkt Untergruppe	. Methods
E21D 13/04	1-Punkt Untergruppe	. Special equipment; Accessories
		<u>Working-face supports</u>
E21D 15/00	Hauptgruppe	Props (in the building art E04G 25/00); Chocks
E21D 15/02	1-Punkt Untergruppe	. Non-telescopic props
E21D 15/04	2-Punkt Untergruppe	. . with wooden prop parts joined by double conical connectors
E21D 15/06	2-Punkt Untergruppe	. . with parts joined by a lock, with or without slight axial adjustability
E21D 15/08	3-Punkt Untergruppe	. . . with toggle joint connection
E21D 15/10	3-Punkt Untergruppe	. . . with dog-clutch or pin-and-hole connection
E21D 15/12	3-Punkt Untergruppe	. . . with locking devices located near head or foot
E21D 15/14	1-Punkt Untergruppe	. Telescopic props (general means for fixing telescopic parts together F16B)
E21D 15/15	2-Punkt Untergruppe	. . Means counteracting entry of dirt; Built-in cleaning devices
E21D 15/16	2-Punkt Untergruppe	. . with parts held together by positive means, with or without relative sliding movement when the prop is subject to excessive pressure
E21D 15/18	3-Punkt Untergruppe	. . . with one part resting on a supporting medium, e.g. rubber, sand, bitumen, lead, located in the other part, with or without expulsion or displacement of the medium upon excessive pressure
E21D 15/20	3-Punkt Untergruppe	. . . with pawl, pin, cross-piece, or the like engaging with ratchet teeth, notches, holes, or the like spaced apart at intervals
E21D 15/22	3-Punkt Untergruppe	. . . with member, pin, cross-piece, or the like ruptured, sheared through, or permanently deformed upon excessive pressure
E21D 15/24	3-Punkt Untergruppe	. . . with axial screw-and-nut, rack-and-worm, or like mechanism
E21D 15/26	4-Punkt Untergruppe	 with screw, worm, or the like not self-locking but normally prevented from rotation by friction members which slip upon excessive pressure
E21D 15/28	2-Punkt Untergruppe	. . with parts held relatively to each other by friction or gripping, e.g. using wedges
E21D 15/30	3-Punkt Untergruppe	. . . by means expanded or contracted by pressure applied through the medium of a fluid or quasi-fluid, e.g. rubber
E21D 15/32	3-Punkt Untergruppe	. . . by a deformable collar

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E21D 15/34	3-Punkt Untergruppe	. . . by axially-moving balls, rollers, or the like
E21D 15/36	3-Punkt Untergruppe	. . . by a tiltable collar surrounding one or both parts
E21D 15/38	3-Punkt Untergruppe	. . . with longitudinally-divided upper or lower prop parts, e.g. interfitting laminations
E21D 15/40	3-Punkt Untergruppe	. . . Collar or other support gripped to one or both parts by toggle-action, cam, or other member pivoted or similarly mounted
E21D 15/42	3-Punkt Untergruppe	. . . with special parts to influence the friction
E21D 15/43	3-Punkt Untergruppe	. . . Details of wedges (friction linings or pads E21D 15/42)
E21D 15/44	2-Punkt Untergruppe	. . Hydraulic, pneumatic, or hydraulic-pneumatic props
E21D 15/45	3-Punkt Untergruppe	. . . having closed fluid system, e.g. with built-in pumps or accumulators
E21D 15/46	2-Punkt Untergruppe	. . with load-measuring devices; with alarm devices
E21D 15/48	1-Punkt Untergruppe	. Chocks or the like
E21D 15/50	1-Punkt Untergruppe	. Component parts or details of props (E21D 15/43 , E21D 15/58 , E21D 15/60 take precedence)
E21D 15/502	2-Punkt Untergruppe	. . Prop bodies characterised by their shape, e.g. of specified cross-section
E21D 15/51	2-Punkt Untergruppe	. . specially adapted to hydraulic, pneumatic, or hydraulic-pneumatic props, e.g. arrangements of relief valves
E21D 15/52	2-Punkt Untergruppe	. . Extensible units located above or below standard props
E21D 15/54	2-Punkt Untergruppe	. . Details of the ends of props (for permitting step-by-step movement E21D 23/06)
E21D 15/55	3-Punkt Untergruppe	. . . of prop heads
E21D 15/56	2-Punkt Untergruppe	. . Details of locks of telescopic props
E21D 15/58	1-Punkt Untergruppe	. Devices for setting props
E21D 15/582	2-Punkt Untergruppe	. . for mechanical props
E21D 15/59	2-Punkt Untergruppe	. . for hydraulic, pneumatic, or hydraulic-pneumatic props
E21D 15/60	1-Punkt Untergruppe	. Devices for withdrawing props or chocks
E21D 17/00	Hauptgruppe	Caps for supporting mine roofs
E21D 17/01	1-Punkt Untergruppe	. characterised by the shape of the cap, e.g. of specified cross-section
E21D 17/02	1-Punkt Untergruppe	. Cantilever extension or similar protecting devices
E21D 17/022	2-Punkt Untergruppe	. . Auxiliary devices for temporary support of roof-supporting beams whilst assembling
E21D 17/03	2-Punkt Untergruppe	. . Brackets for roof-supporting bars
E21D 17/04	2-Punkt Untergruppe	. . for use in longwall working
E21D 17/05	3-Punkt Untergruppe	. . . hydraulically extensible
E21D 17/054	3-Punkt Untergruppe	. . . hydraulically pivotable
E21D 17/06	2-Punkt Untergruppe	. . for use in drifting galleries
E21D 17/08	2-Punkt Untergruppe	. . Cap joints for obtaining a coal-face free of pit-props
E21D 17/082	3-Punkt Untergruppe	. . . of sliding type

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E21D 17/086	3-Punkt Untergruppe	. . . of articulated type
E21D 17/10	1-Punkt Untergruppe	. Details of mine caps for engaging the tops of pit-props, with or without retaining-plates; Retaining-plates
E21D 19/00	Hauptgruppe	Provisional protective covers for working space (E21D 9/06 , E21D 23/00 take precedence) [3]
E21D 19/02	1-Punkt Untergruppe	. for use in longwall working
E21D 19/04	1-Punkt Untergruppe	. for use in drifting galleries
E21D 19/06	1-Punkt Untergruppe	. Arrangements for applying the covers [6]
E21D 20/00	Hauptgruppe	Setting anchoring-bolts (anchoring bolts for shafts, tunnels or galleries E21D 21/00; means for anchoring structural elements or bulkheads specially adapted to foundation engineering E02D 5/74; dowels or other devices fastened in walls or the like by inserting them in holes made therein for that purpose F16B 13/00) [5]
E21D 20/02	1-Punkt Untergruppe	. with provisions for grouting
E21D 21/00	Hauptgruppe	Anchoring-bolts for roof, floor, or shaft-lining protection (dowels or other devices fastened in walls or the like by inserting them in holes made therein for that purpose F16B 13/00) [5]
E21D 21/02	1-Punkt Untergruppe	. having means for indicating tension (screwed connections specially modified for indicating tensile load F16B 31/02)
E21D 23/00	Hauptgruppe	Mine roof supports for step-by-step movement, e.g. in combination with provisions for shifting of conveyers, mining machines, or guides therefor (shifting of mine conveyers at the working face, per se E21F 13/08)
E21D 23/03	1-Punkt Untergruppe	. having protective means, e.g. shields, for preventing or impeding entry of loose material into the working space or support [4]
E21D 23/04	1-Punkt Untergruppe	. Structural features of the supporting construction, e.g. linking members between adjacent frames or sets of props; Means for counteracting lateral sliding on inclined floor (E21D 23/14 takes precedence)
E21D 23/06	2-Punkt Untergruppe	. . Special mine caps or special tops of pit-props for permitting step-by-step movement
E21D 23/08	1-Punkt Untergruppe	. Advancing mechanisms (E21D 23/16 takes precedence)
E21D 23/10	2-Punkt Untergruppe	. . with advancing devices separate from the supporting construction
E21D 23/12	1-Punkt Untergruppe	. Control, e.g. using remote control (E21D 23/16 takes precedence)
E21D 23/14	2-Punkt Untergruppe	. . Effecting automatic sequential movement of supports, e.g. one behind the other
E21D 23/16	1-Punkt Untergruppe	. Hydraulic or pneumatic features, e.g. circuits, arrangement or adaptation of valves, setting or retracting devices
E21D 23/18	2-Punkt Untergruppe	. . of advancing mechanisms
E21D 23/20	3-Punkt Untergruppe	. . . for sequential movement, e.g. one behind the other
E21D 23/22	3-Punkt Untergruppe	. . . incorporated in mine caps
E21D 23/24	3-Punkt Untergruppe	. . . the advancing mechanisms being separate from the supporting construction
E21D 23/26	2-Punkt Untergruppe	. . Hydraulic or pneumatic control