CPC COOPERATIVE PATENT CLASSIFICATION

H ELECTRICITY

(NOTE omitted)

H01 BASIC ELECTRIC ELEMENTS

(NOTE omitted)

H01H ELECTRIC SWITCHES; RELAYS; SELECTORS; EMERGENCY PROTECTIVE DEVICES (contact cables H01B 7/10; overvoltage protection resistors, resistive arresters H01C 7/12, H01C 8/04; electrolytic self-interrupters H01G 9/18; switching devices of the waveguide type H01P; devices for interrupted current collection H01R 39/00; overvoltage arresters using spark gaps H01T 4/00; emergency protective circuit arrangements H02H; switching by electronic means without contact-making H03K 17/00)

NOTES

1. Attention is drawn to the Notes following the titles of class B81 an subclass B81B relating to "microstructural devices" and microstructural systems"
2. This subclass covers (in groups H01H 69/00 - H01H 87/00) devices for the protection of electric lines or electric machines or apparatus in the event of undesired change from normal electric working conditions, the electrical condition serving directly as the input to the device.
3. This subclass does not cover bases, casings, or covers accommodating two or more switching devices or for accommodating a switching device as well as another electric component, e.g. bus-bar, line connector. Those bases, casings or covers are covered by group H02B 1/26.
4. In this subclass, the following terms or expressions are used with the meanings indicated :
   - "relay" means a switching device having contacts which are operated from electric inputs which supply, directly or indirectly, all the mechanical energy necessary to cause both the closure and the opening of the contacts;
   - "driving mechanism" refers to the means by which an operating force applied to the switch is transmitted to the moving contact or contacts;
   - "operating" is used in a broader sense than "actuating" which is reserved for those parts not touched by hand to effect switching;
   - "acting" or "action" means a self-induced movement of parts at one stage of the switching.

   These connotations apply to all parts of the verbs "to operate", "to actuate" and "to act" and to words derived therefrom, e.g. to "actuation".
5. In this subclass, details are classified as follows :
   - details of an unspecified type of switching device, or disclosed as applicable to two or more kinds of switching devices designated by the terms or expressions "switches", "relays", "selector switches", and "emergency protective devices", are classified in groups H01H 1/00 - H01H 9/00;
   - details of an unspecified type of switch, or disclosed as applicable to two or more types of switches as defined by groups H01H 13/00 - H01H 43/00 and sub-groups H01H 35/02, H01H 35/06, H01H 35/14, H01H 35/18, H01H 35/24 and H01H 35/42, all hereinafter called basic types, are classified in groups H01H 1/00 - H01H 9/00;
   - details of an unspecified type of relay, or disclosed as applicable to two or more types of relays as defined by groups H01H 51/00 - H01H 61/00, hereinafter called basic types are classified in H01H 45/00;
   - details of an unspecified protective device, or applicable to two or more types of protective devices as defined by groups H01H 73/00 - H01H 83/00, hereinafter called basic types, are classified in H01H 71/00.
   - However, details only described with reference to, or clearly only applicable to, switching devices of a single basic type, are classified in the group appropriate to switching devices of that basic type, e.g. H01H 19/02, H01H 75/04;
   - mechanical structural details of control members of switches or of keyboards such as keys, push-buttons, levers or other mechanisms for transferring the force to the activated elements are classified in this subclass, even when they are used for controlling electronic switches.

   However, mechanical details directly producing electronic effects are classified in group H03K 17/94.

WARNINGS

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

H01H 13/708-H01H 13/718	covered by	H01H 13/702
H01H 33/575	covered by	H01H 33/56
H01H 33/65	covered by	H01H 33/64
H01H 33/825	covered by	H01H 33/82
H01H 33/835	covered by	H01H 33/83
H01H 33/867	covered by	H01H 33/86

H01H (continued)

H01H 33/873	covered by	H01H 33/86
H01H 33/915	covered by	H01H 33/91
H01H 33/985	covered by	H01H 33/98
H01H 33/99	covered by	H01H 33/98

2. In this subclass non-limiting references (in the sense of paragraph 39 of the Guide to the IPC) may still be displayed in the scheme.

Electric switches

1/00 **Contacts** (liquid contacts H01H 29/04)

2001/0005 . {Redundant contact pairs in one switch for safety reasons}

2001/001 . {providing easy replacement of contacts}

1/0015 . {Means for testing or for inspecting contacts, e.g. wear indicator (measuring circuits G01R 31/3274)}

2001/0021 . . {Camera or endoscope for monitoring contacts, their position or mechanism}

2001/0026 . . {wherein one or both contacts contain embedded contact wear signal material, e.g. radioactive material being released as soon as the contact wear reaches the embedded layer}

2001/0031 . . {by analysing radiation emitted by arc or trace material}

1/0036 . {Switches making use of microelectromechanical systems [MEMS] ; (for electrostatic relays H01H 59/0009, for electromagnetic relays H01H 50/005; MEMS manufacturing processes B81C)}

2001/0042 . . {Bistable switches, i.e. having two stable positions requiring only actuating energy for switching between them, e.g. with snap membrane or by permanent magnet}

2001/0047 . . . {operable only by mechanical latching}

2001/0052 . . {Special contact materials used for MEMS}

2001/0057 . . . {the contact materials containing refractory materials, e.g. tungsten}

2001/0063 . . {having electrostatic latches, i.e. the activated position is kept by electrostatic forces other than the activation force}

2001/0068 . . {with multi dimensional movement, i.e. the movable actuator performing movements in at least two different directions}

2001/0073 . . {Solutions for avoiding the use of expensive silicon technologies in micromechanical switches}

2001/0078 . . {with parallel movement of the movable contact relative to the substrate}

2001/0084 . . {with perpendicular movement of the movable contact relative to the substrate}

2001/0089 . . {Providing protection of elements to be released by etching of sacrificial element; Avoiding stiction problems, e.g. of movable element to substrate}

1/0094 . {Switches making use of nanoelectromechanical systems [NEMS]}

1/02 . characterised by the material thereof {(containing gas-evolving material H01H 33/765)}

1/0201 . . {Materials for reed contacts}

1/0203 . . {specially adapted for vacuum switches}

2001/0205 . . . {Conditioning of the contact material through arcing during manufacturing, e.g. vacuum-depositing of layer on contact surface}

1/0206 . . . {containing as major components Cu and Cr}

2001/0208 . . {containing rhenium}

1/021 . . Composite materials

NOTES

1. In this group, the following expression is used with the meaning indicated :
   - "composite material" is a material made of two or more different materials, e.g. coated material, layered materials or carbon fibres in a copper base or matrix
2. Subject matter classifiable in more than one of the groups H01H 1/023 - H01H 1/029 should be classified in all relevant groups.

1/023 . . . having a noble metal as the basic material

1/0231 . . . . {provided with a solder layer}

1/0233 . . . . and containing carbides

1/0237 . . . . and containing oxides

1/02372 . . . . . {containing as major components one or more oxides of the following elements only : Cd, Sn, Zn, In, Bi, Sb or Te (if other oxides are mentioned H01H 1/0237)}

1/02374 . . . . . {containing as major component CdO}

1/02376 . . . . . {containing as major component SnO_2}

2001/02378 . . . . . {containing iron-oxide as major component}

1/025 . . . having copper as the basic material

1/027 . . . containing carbon particles or fibres

1/029 . . . comprising conducting material dispersed in an elastic support or binding material

1/04 . . Co-operating contacts of different material

1/06 . characterised by the shape or structure of the contact-making surface, e.g. grooved

1/065 . . {formed by freely suspended particles, e.g. magnetic dust or balls}

1/08 . . wetted with mercury

1/10 . . Laminated contacts with divided contact surface

1/12 . characterised by the manner in which co-operating contacts engage

2001/125 . . {whereby the contacts of the switch are formed by teeth of a zipper}

1/14 . . by abutting

2001/145 . . . {by crossing each other, the cooperating contacts each having a contact making ridge perpendicular to each other}

1/16 . . . by rolling; by wrapping; Roller or ball contacts

1/18 . . . with subsequent sliding

1/20 . . . Bridging contacts {(for circuit breakers H01H 73/045)}

1/2008 . . . . {Facilitate mounting or replacing contact bridge and pressure spring on carrier (H01H 11/0012 takes precedence)}

1/2016 . . . . {in which the two contact pairs commutate at substantially different moments}

1/2025 . . . . {comprising two-parallel bridges}

2001/2033 . . . . . {with a contact bridge on both opposite sides of a fixed contact pair, each contact bridge being moved to close or open the circuit}
1/2041 . . . . {Rotating bridge}
1/205 . . . . . {Details concerning the elastic mounting of the rotating bridge in the rotor}
1/2058 . . . . . {Rotating bridge being assembled in a cassette, which can be placed as a complete unit into a circuit breaker (non-rotating bridges H01H 71/0235)}
1/2066 . . . . {Fork-shaped bridge; Two transversally connected contact arms bridging two fixed contacts}
1/2075 . . . . {T-shaped bridge; bridging contact has lateral arm for mounting resiliently or on a pivot}
1/2083 . . . . {Bridging contact surfaces directed at an oblique angle with respect to the movement of the bridge}
2001/2091 . . . . {having two pivotally and electrically connected halve bridges}
1/22 . . . with rigid pivoted member carrying the moving contact
1/221 . . . . {and a contact pressure spring acting between the pivoted member and a supporting member}
2001/223 . . . . . {using a torsion spring}
1/225 . . . . . {the supporting member being pivotable}
1/226 . . . . . {having a plurality of parallel contact bars}
2001/228 . . . . . {with insulating spacers between the contact bars}
1/24 . . . with resilient mounting
1/242 . . . . {the contact forming a part of a coil spring}
1/245 . . . . {Spring wire contacts}
2001/247 . . . . {using an elastic hinge, the contact being composed of rigid parts connected by thinned flexible hinge parts}
1/26 . . . . with spring blade support
2001/265 . . . . . {having special features for supporting, locating or pre-stressing the contact blade springs}
1/28 . . . . . Assembly of three or more contact-supporting spring blades
1/30 . . . . within supporting guides
1/32 . . . Self-aligning contacts
1/34 . . . with provision for adjusting position of contact relative to its co-operating contact
1/36 . . by sliding (by rolling or wrapping H01H 1/16)
1/365 . . . {Bridging contacts}
1/38 . . . Plug-and-socket contacts
1/385 . . . . {Contact arrangements for high voltage gas blast circuit breakers}
1/40 . . . Contact mounted so that its contact-making surface is flush with adjoining insulation
1/403 . . . . {Contacts forming part of a printed circuit (multilayer keyboard switches H01H 13/702; thumbwheel switches H01H 19/001; for rotary switches with axial contact pressure H01H 19/585; printed contacts per se H05K)}
2001/406 . . . . {with holes or recesses between adjacent contacts, e.g. to collect abrasion powder}
1/42 . . . Knife-and-clip contacts
2001/425 . . . . {with separate contact pressure spring confined between two contact knifes and urging the knifes onto a mating contact}
1/44 . . . with resilient mounting
1/46 . . . self-aligning contacts
1/48 . . . with provision for adjusting position of contact relative to its co-operating contact
1/50 . Means for increasing contact pressure, preventing vibration of contacts, holding contacts together after engagement, or biasing contacts to the open position
1/502 . . {the action of the contact pressure spring becoming active only after engagement of the contacts}
1/504 . . {by thermal means}
2001/506 . . {Fail safe contacts, i.e. the contacts being kept in a safe position, usually in an open circuit position, at end of life time of switch}
2001/508 . . {with mechanical means to prevent return/reverse movement of movable contact once opening or closing cycle has started}
1/52 . . Contacts adapted to act as latches
1/54 . . by magnetic force {(combined with electrodynamic opening H01H 77/101)}
2001/545 . . . {having permanent magnets directly associated with the contacts}
1/56 . Contact arrangements for providing make-before-break operation, e.g. for on-load tap changing {(for tap changers H01H 9/0016)}
1/58 . Electric connections to or between contacts; Terminals ({for high tension switches H01H 33/025; for electromagnetic relays H01H 50/14; for circuit breakers H01H 71/08}; electric connections in general H01R)
1/5805 . . {Connections to printed circuits (for slide switches H01H 15/005; for tumbler switches H01H 23/006)}
2001/5811 . . . {both fixed and movable contacts being formed by blank stamping and mounted or soldered on printed circuit board without any other housing elements}
2001/5816 . . . {Connections to flexible or curved printed circuit boards}
1/5822 . . {Flexible connections between movable contact and terminal}
2001/5827 . . . {Laminated connections, i.e. the flexible conductor is composed of a plurality of thin flexible conducting layers}
1/5833 . . {comprising an articulating, sliding or rolling contact between movable contact and terminal}
2001/5838 . . . {using electrodynamic forces for enhancing the contact pressure between the sliding surfaces}
1/5844 . . {making use of wire-gripping clips or springs}
1/585 . . . {and piercing the wire insulation}
1/5855 . . {characterised by the use of a wire clamping screw or nut}
2001/5861 . . . {Box connector with a collar or lug for clamping internal rail and external conductor together by a tightening screw}
1/5866 . . {characterised by the use of a plug and socket connector}
2001/5872 . . . {including means for preventing incorrect coupling}

2001/5877 . . {with provisions for direct mounting on a battery pole}
2001/5883 . . {the extension of the contact being crimped around a wire}
2001/5888 . . {Terminals of surface mounted devices [SMD]}
2001/5894 . . {the extension of the contact being welded to a wire or a bus}
1/60 . Auxiliary means structurally associated with the switch for cleaning or lubricating contact-making surfaces (cleaning by normal sliding of contacts H01H 1/18, H01H 1/36)
1/605 . . {Cleaning of contact-making surfaces by relatively high voltage pulses}
1/62 . Heating or cooling of contacts
1/64 . Protective enclosures, baffle plates, or screens for contacts (for arc-extinguishing H01H 9/30; for mercury contacts H01H 29/04)
1/645 . . {containing getter material (for explosion inhibiting in explosion-proofcases H01H 9/046; for vacuum switches H01H 33/6683)}
1/66 . . Contacts sealed in an evacuated or gas-filled envelope, e.g. magnetic dry-reed contacts

3/00 Mechanisms for operating contacts (snap-action arrangements H01H 5/00; devices for introducing a predetermined time delay H01H 7/00; {for tap changers H01H 9/0027}; thermal actuating or release means H01H 37/02)

3/001 . {Means for preventing or breaking contact-welding}
2003/002 . . {with lockout, e.g. two contact pairs in series}
3/004 . {for operating contacts periodically}
3/005 . {making use of superconductivity, e.g. levitation switch}
2003/007 . {the contacts being actuated by deformation of a flexible housing}
2003/008 . {with a haptic or a tactile feedback controlled by electrical means, e.g. a motor or magnetofriction}
3/02 . Operating parts, i.e. for operating driving mechanism by a mechanical force external to the switch
3/0206 . . {Combined operation of electric switch and of fluid control device}
3/0213 . . {Combined operation of electric switch and variable impedance, e.g. resistor, capacitor (H01H 9/061 takes precedence)}
3/022 . . {Emergency operating parts, e.g. for stop-switch in dangerous conditions}
3/0226 . . . {operated by a pull cord}
2003/0233 . . . {for alarm triggering, e.g. fire alarm, emergency off switches operated by breaking a glass}
2003/024 . . . {Resetting of bistable emergency operating part by pulling it}
2003/0246 . . . {Resetting of bistable emergency operating part by rotating itself or an accessory}
3/0253 . . {two co-operating contacts actuated independently (for combined circuit-breaker-contactors H01H 89/10)}
2003/026 . . {specially adapted to avoid injury to occupants of a car during an accident}
2003/0266 . . {Operating part bringable in an inoperative position by an electrical drive}
2003/0273 . . {Manually irreversibly actuated switch}
2003/028 . . {Rotating knob or lever or tumbler that can be turned or pushed by hand in only one direction, e.g. by making inaccessible one side of a tumbler}
2003/0286 . . {having a weak point breaking or uncoupling on abnormal external force}
2003/0293 . . {with an integrated touch switch}
3/04 . . Levers (tumblers H01H 23/14)
3/06 . . . Means for securing to shaft of driving mechanism
3/08 . . Turn knobs
2003/085 . . . {Retractable turn knobs, e.g. flush mounted}
3/10 . . . Means for securing to shaft of driving mechanism
2003/105 . . . . {with compensation of misalignment in the link between the operating part, the driving mechanism and the switch, e.g. misalignment between two axis}
3/12 . . Push-buttons
3/122 . . . {with enlarged actuating area, e.g. of the elongated bar-type; Stabilising means therefor}
3/125 . . . . {using a scissor mechanism as stabiliser}
2003/127 . . . {Details of the key cap concerning the actuation by fingernails or having provision to allow usage with long fingernails}
3/14 . . adapted for operation by a part of the human body other than the hand, e.g. by foot
3/141 . . . {Cushion or mat switches}
3/142 . . . . {of the elongated strip type}
2003/143 . . . . . {provisions for avoiding the contact actuation when the elongated strip is bended}
2003/145 . . . . {provisions for avoiding closure or contact damage during manufacturing or mounting}
2003/146 . . . . {being normally closed}
2003/147 . . . . {Special aspects regarding the peripheral edges of the mat switches}
2003/148 . . . . {the mat switch being composed by independently juxtaposed contact tiles, e.g. for obtaining a variable protected area}
3/16 . . adapted for actuation at a limit or other predetermined position in the path of a body, the relative movement of switch and body being primarily for a purpose other than the actuation of the switch, e.g. for a door switch, a limit switch, a floor-levelling switch of a lift
3/161 . . . {for actuation by moving a closing member, e.g. door, cover, lid (H01H 27/002 takes precedence; the switch controlling enclosed equipment H01H 9/226; safety arrangements on doors of dishwashers A47L 15/4236, of laundry washing machines D06F 37/42, of ovens F24C 14/00, F24C 15/022; locks with means for operating switches E05B 17/22; alarm locks E05B 45/06; safety edges for power-operated wings E05F 15/40; safety devices in connection with the locking of doors, covers, guards, or like members giving access to movable machine parts F16P 3/08; of microwave ovens H05B 6/76)}
3/162 . . . . {associated with a hinge of the closing member}
3/163 . . . . {associated with locking or manipulating means of the closing member}

2003/165 . . . . {associated with an edge of the closing member}
3/166 . . . {Self-adjusting mountings, transmissions and the like}
2003/167 . . . . {with locking of the adjusted parts in the adjusted position by a separate action}
3/168 . . . {operated by movement in any direction}
3/18 . . . the movement in one direction being intentionally by hand, e.g. for setting automatically cancelled trafficators
3/20 . . wherein an auxiliary movement thereof, or of an attachment thereto, is necessary before the main movement is possible or effective, e.g. for unlatching, for coupling
3/22 . Power arrangements internal to the switch for operating the driving mechanism
3/222 . . {using electrodynamic repulsion}
2003/225 . . . {with coil contact, i.e. the movable contact itself forms a secondary coil in which the repulsing current is induced by an operating current in a stationary coil}
3/227 . . {Interlocked hand- and power-operating mechanisms}
3/24 . . using pneumatic or hydraulic actuator {(for storing energy in a spring motor H01H 3/301)}
3/26 . . using dynamo-electric motor (for storing energy in a spring motor H01H 3/30)
3/262 . . . {using a centrifugal mechanism}
3/264 . . . {using a travelling nut mechanism}
2003/266 . . . {having control circuits for motor operating switches, e.g. controlling the opening or closing speed of the contacts}
2003/268 . . . {using a linear motor}
3/28 . . using electromagnet (for storing energy in a spring motor H01H 3/30; for operating relays H01H 45/00)
3/30 . . using spring motor
3/3005 . . . {Charging means}
3/301 . . . . {using a fluid actuator}
3/3015 . . . . {using cam devices}
3/3021 . . . . {using unidirectional coupling}
3/3026 . . . . {in which the closing spring charges the opening spring or vice versa}
3/3031 . . . {Means for locking the spring in a charged state}
2003/3036 . . . . {using of balls or rollers in the locking device}
3/3042 . . . {using a torsion spring}
3/3047 . . . {adapted for operation of a three-position switch, e.g. on-off-earth}
3/3052 . . . {Linear spring motors}
2003/3057 . . . {provisions for avoiding idling, e.g. preventing release of stored energy when a breaker is closed, or when the springs are not fully charged}
2003/3063 . . . {Decoupling charging handle or motor at end of charging cycle or during charged condition}
2003/3068 . . . {Housing support frame for energy accumulator and cooperating mechanism}
2003/3073 . . . {Indication of the charge on the spring motor}
2003/3078 . . . {using an inertia element, e.g. a flywheel, to controll the energy released by the spring}
2003/3084 . . . {Kinetic energy of moving parts recuperated by transformation into potential energy in closing or opening spring to be used in next operation}
2003/3089 . . . {Devices for manual releasing of locked charged spring motor; Devices for remote releasing}
2003/3094 . . . {allowing an opening - closing - opening [OCO] sequence}
3/32 . Driving mechanisms, i.e. for transmitting driving force to the contacts (snap-action arrangements H01H 5/00; introducing a predetermined time delay H01H 7/00)
2003/323 . . {the mechanisms being adjustable}
2003/326 . . {using bearings}
3/34 . . using ratchet
3/36 . . using belt, chain, or cord
3/38 . . using spring or other flexible shaft coupling
3/40 . . using friction, toothed, or screw-and-nut gearing
2003/405 . . . {using a walking nut}
3/42 . . using cam or eccentric
3/44 . . using Geneva movement
3/46 . . using rod or lever linkage, e.g. toggle
2003/463 . . . {using a blade spring lever for perpendicular force transmission}
2003/466 . . . {using a living hinge to connect the levers}
3/48 . . using lost-motion device
3/50 . . with indexing or locating means, e.g. indexing by ball and spring
3/503 . . . {making use of electromagnets}
2003/506 . . . {making use of permanent magnets}
3/52 . . with means to ensure stopping at intermediate operative positions
3/54 . Mechanisms for coupling or uncoupling operating parts, driving mechanism or contacts
3/56 . . using electromagnetic clutch
3/58 . . using friction, toothed, or other mechanical clutch
3/60 . Mechanical arrangements for preventing or damping vibration or shock
3/605 . . {making use of a fluid damper}
3/62 . Lubricating means structurally associated with the switch (for lubricating contact-making surfaces H01H 1/60)

5/00 Snap-action arrangements, i.e. in which during a single opening operation or a single closing operation energy is first stored and then released to produce or assist the contact movement

5/02 . Energy stored by the attraction or repulsion of magnetic parts
5/04 . Energy stored by deformation of elastic members (by deformation of bimetallic elements in thermally-actuated switches H01H 37/54)
5/045 . . {making use of cooperating spring loaded wedging or camming parts between operating member and contact structure}
5/06 . . by compression or extension of coil springs
5/08 . . . one end of spring transmitting movement to the contact member when the other end is moved by the operating part
5/10 . . . one end of spring being fixedly connected to the stationary or movable part of the switch and the other end reacting with a movable or stationary rigid member respectively through pins, cams, toothed or other shaped surfaces

5/12 . . . having two or more snap-action motions in succession
5/14 . . by twisting of torsion members
5/16 . . . with auxiliary means for temporarily holding parts until torsion member is sufficiently strained
5/18 . . by flexing of blade springs
5/20 . . . single blade moved across dead-centre position
5/22 . . . blade spring with at least one snap-acting leg and at least one separate contact-carrying or contact-actuating leg
5/24 . . . . having three legs
5/26 . . . having two or more snap-action motions in succession
5/28 . . . two separate blade springs forming a toggle
5/30 . . by buckling of disc springs

7/00 Devices for introducing a predetermined time delay between the initiation of the switching operation and the opening or closing of the contacts (time or time-programme switches H01H 43/00)
7/02 . with fluid timing means
7/03 . . with dash-pots
7/04 . . with flies, i.e. fan governors
7/06 . with thermal timing means (thermally actuated switches H01H 37/00)
7/08 . with timing by mechanical speed-control devices
7/10 . . by escapement
7/12 . . . mechanical
7/14 . . . electromagnetic
7/16 . Devices for ensuring operation of the switch at a predetermined point in the ac cycle (circuit arrangements H01H 9/56)

9/00 Details of switching devices, not covered by groups H01H 1/00 - H01H 7/00 (casings for switchgear H02B 1/26; casings for electrical apparatus in general H05K 5/00)
9/0005 . {Tap change devices}
9/0011 . . {Voltage selector switches}
9/0016 . . {Contact arrangements for tap changers}
2009/0022 . . . {Mounting of the fixed contacts or taps on cylindrical wall of oil vessel containing the tap changer; Details of screening}
9/0027 . . {Operating mechanisms}
9/0033 . . . {with means for indicating the selected tap or limiting the number of selectable taps}
9/0038 . . {making use of vacuum switches}
9/0044 . . {Casings; Mountings; Disposition in transformer housing}
2009/005 . . . {Details concerning the sealing of the oil filled casings}
2009/0055 . . {Oil filters for tap change devices}
2009/0061 . . {Monitoring tap change switching devices}
9/0066 . {Auxiliary contact devices (for arc transfer H01H 9/38; for electromagnetic relays H01H 50/541)}
9/0072 . {particular to three-phase switches (synchronous switching H01H 9/563)}
2009/0077 . {using recyclable materials, e.g. for easier recycling or minimising the packing material}
2009/0083 . {using redundant components, e.g. two pressure tubes for pressure switch}
2009/0088 . {Details of rotatable shafts common to more than one pole or switch unit}
2009/0094 . {Details of rotatable shafts which are subdivided; details of the coupling means thereof}
9/02 . Bases, casings, or covers (accommodating more than one switch or a switch and another electrical component H02B 1/26)
9/0207 . . {Adjustable mounting of casings}
9/0214 . . {Hand-held casings}
2009/0221 . . . {the switches being fixed to the operator's hand, e.g. integrated in a glove or fixed to a ring}
9/0228 . . . {Line cord switches}
9/0235 . . . {specially adapted for remote control, e.g. of audio or video apparatus}
9/0242 . . . . {Protective enclosures; Cushioning means}
9/025 . . . . {Stands or organisers to facilitate location or operation}
2009/0257 . . . . {Multisided remote control, comprising control or display elements on at least two sides, e.g. front and back surface}
9/0264 . . {Protective covers for terminals}
9/0271 . . {structurally combining a switch and an electronic component (for relays H01H 50/021)}
2009/0278 . . {Casings containing special noise reduction means, e.g. elastic foam between inner and outer casing}
2009/0285 . . {Casings overmoulded over assembled switch or relay}
2009/0292 . . {Transparent window or opening, e.g. for allowing visual inspection of contact position or contact condition}
9/04 . . Dustproof, splashproof, drip-proof, waterproof, or flameproof casings
9/041 . . . {Casings hermetically closed by a diaphragm through which passes an actuating member (vacuum switches H01H 33/66)}
9/042 . . . {Explosion-proof cases}
9/043 . . . . {with pressure-relief devices}
9/045 . . . . {with interlocking mechanism between cover and operating mechanism}
9/046 . . . . {with internal explosion inhibiting means}
9/047 . . . {provided with venting means}
2009/048 . . . {using a sealing boot, e.g. the casing having separate elastic body surrounding the operating member and hermetically closing the opening for it}
9/06 . . Casing of switch constituted by a handle serving a purpose other than the actuation of the switch, e.g. by the handle of a vacuum cleaner
9/061 . . . {enclosing a continuously variable impedance}
9/063 . . . {enclosing a reversing switch}
2009/065 . . . {Battery operated hand tools in which the battery and the switch are directly connected}
2009/066 . . . {having switches mounted on a control handle, e.g. gear shift lever}
2009/068 . . . {with switches mounted on a handlebar, e.g. for motorcycles, fork lift trucks, etc.}
9/08 . Arrangements to facilitate replacement of a switch, e.g. cartridge housing
9/085 . . {contact separation effected by removing contact carrying element}
9/10 . Adaptation for built-in fuses (mounting switch and fuse separately on, or in, common support H02B)

9/102 . . {Fuses mounted on or constituting the movable contact parts of the switch}
9/104 . . {with interlocking mechanism between switch and fuse}
9/106 . . {fuse and switch being connected in parallel}
2009/108 . . {Building a sliding and/or a removable bridging connector for batteries}
9/12 . Means for earthing parts of switch not normally conductively connected to the contacts
9/14 . Adaptation for built-in safety spark gaps
9/16 . Indicators for switching condition, e.g. "on" or "off"
9/161 . . {comprising light emitting elements}
9/162 . . . {Means to facilitate removal or replacement of light-emitting elements}
2009/164 . . . {the light emitting elements being incorporated in and movable with the operating part}
9/165 . . {comprising numbered dials (thumb-wheel switches H01H 19/001)}
9/167 . . {Circuits for remote indication (for protection circuits H02H 3/04; for distribution networks H02J 13/00)}
9/168 . . {making use of an electromagnetic wave communication}
9/18 . Distinguishing marks on switches, e.g. for indicating switch location in the dark; Adaptation of switches to receive distinguishing marks
9/181 . . {using a programmable display, e.g. LED or LCD}
9/182 . . {Illumination of the symbols or distinguishing marks (H01H 9/181 takes precedence)}
2009/183 . . . {Provisions for enhancing the contrast between the illuminated symbol and the background or between juxtaposed symbols}
2009/184 . . . {Illumination of symbols by using laser light}
9/185 . . {Fluorescent or phosphorescent symbols or distinguishing marks (H01H 9/181 takes precedence)}
2009/186 . . {using an electroluminiscent panel}
2009/187 . . {having symbols engraved or printed by laser}
2009/188 . . {with indication of rating}
2009/189 . . {with a tactile symbol or indication, e.g. for blind people}
9/20 . Interlocking, locking, or latching mechanisms (contacts adapted to act as latches H01H 1/52; by an auxiliary movement of the operating part or of an attachment thereto H01H 3/20; {for withdrawable switchgear H02B 11/00})
9/22 . . for interlocking between casing, cover, or protective shutter and mechanism for operating contacts {(explosion-proof cases H01H 9/045; built-in fuses and interlocking mechanisms H01H 9/104; by automatic release of circuit breakers H01H 71/126)}
9/223 . . . {Defeatable locking means}
9/226 . . . {the casing containing electrical equipment other than and operated by the switch}
9/24 . . for interlocking two or more parts of the mechanism for operating contacts
9/26 . . for interlocking two or more switches ({H01H 13/568 takes precedence}; by a detachable member H01H 9/28 {; for electromagnetic relays H01H 50/323})
9/262 . . . {using flexible transmission elements, e.g. Bowden cable}
2009/265 . . . {with interlocking of more than two switches}
2009/267 . . . {with interlocking of two out of three switches, e.g. two switches each connecting a power supply to a busbar and a bus coupling switch interlocked in such a way that the power supplies are never connected in parallel}
9/28 . . for locking switch parts by a key or equivalent removable member (switches operated by a key H01H 27/00; locking by removable part of two-part coupling device H01R)
9/281 . . . {making use of a padlock (H01H 9/287 takes precedence)}
9/282 . . . . {and a separate part mounted or mountable on the switch assembly and movable between an unlocking position and a locking position where it can be secured by the padlock}
9/283 . . . . . {the part being removable}
9/285 . . . {Locking mechanisms incorporated in the switch assembly and operable by a key or a special tool}
9/286 . . . {making use of a removable locking part acting directly on the operating part (H01H 9/281 takes precedence)}
9/287 . . . {wherein the operating part is made inaccessible or more difficult to access by a lid, cover or guard, e.g. lockable covers}
2009/288 . . . {Provisions relating to welded contacts}
9/30 . Means for extinguishing or preventing arc between current-carrying parts
9/302 . . {wherein arc-extinguishing gas is evolved from stationary parts}
2009/305 . . {including means for screening for arc gases as protection of mechanism against hot arc gases or for keeping arc gases in the arc chamber}
2009/307 . . {with slow break, e.g. for AC current waiting for a zero crossing}
9/32 . . Insulating body insertable between contacts
9/34 . . Stationary parts for restricting or subdividing the arc, e.g. barrier plate
9/341 . . . {Barrier plates carrying electrodes}
9/342 . . . {Venting arrangements for arc chutes}
2009/343 . . . . {with variable venting aperture function of arc chute internal pressure, e.g. resilient flap-valve or check-valve}
9/345 . . . {Mounting of arc chutes}
9/346 . . . {Details concerning the arc formation chamber}
2009/347 . . . {using lids for closing the arc chamber after assembly}
2009/348 . . . {Provisions for recirculation of arcing gasses to improve the arc extinguishing, e.g. move the arc quicker into the arcing chamber}
9/36 . . . Metal parts
9/362 . . . . {Mounting of plates in arc chamber}
2009/365 . . . . {using U-shaped plates}
2009/367 . . . . {defining a recurrent path, e.g. the subdivided arc is moved in a closed path between each pair of splitter plates}
9/38 . . Auxiliary contacts on to which the arc is transferred from the main contacts (using arcing-horns H01H 9/46)
9/383 . . . {Arcing contact pivots relative to the movable contact assembly}

9/386 . . . {Arcing contact pivots relative to the fixed contact assembly}
9/40 . . Multiple main contacts for the purpose of dividing the current through, or potential drop along, the arc {(multiple parallel contact bars H01H 1/226)}
9/42 . . Impedances connected with contacts
9/44 . . using blow-out magnet
9/443 . . . {using permanent magnets}
9/446 . . . {using magnetisable elements associated with the contacts}
9/46 . . using arcing-horn (using blow-out magnet H01H 9/44; arcing-horns per se H01T 4/14)
9/465 . . . {Shunt circuit closed by transferring the arc onto an auxiliary electrode}
9/48 . Means for preventing discharge to non-current-carrying parts, e.g. using corona ring
9/50 . Means for detecting the presence of an arc or discharge
9/52 . Cooling of switch parts (cooling of contacts H01H 1/62)
2009/523 . . {by using heat pipes}
2009/526 . . {of the high voltage switches}
9/54 . Circuit arrangements not adapted to a particular application of the switching device and for which no provision exists elsewhere
9/541 . . {Contacts shunted by semiconductor devices}
9/542 . . . {Contacts shunted by static switch means}
2009/543 . . . . {third parallel branch comprising an energy absorber, e.g. MOV, PTC, Zener}
2009/544 . . . . {the static switching means being an insulated gate bipolar transistor, e.g. IGBT, Darlington configuration of FET and bipolar transistor}
2009/545 . . . . {comprising a parallel semiconductor switch being fired optically, e.g. using a photocoupler,}
2009/546 . . . . {the static switching means being triggered by the voltage over the mechanical switch contacts}
9/547 . . {Combinations of mechanical switches and static switches, the latter being controlled by the former}
9/548 . . {Electromechanical and static switch connected in series}
9/56 . . for ensuring the operation of the switch at a predetermined point in the cycle
9/563 . . . {for multipolar switches, e.g. different timing for different phases, selecting phase with first zero-crossing}
2009/566 . . . {with self learning, e.g. measured delay is used in later actuations}

11/00 Apparatus or processes specially adapted for manufacture of electric switches (processes specially adapted for manufacture of rectilinearly movable switches having a plurality of operating members associated with different sets of contacts, e.g. keyboards, H01H 13/88; processes or apparatus specially adapted for the manufacture or treatment of microstructural devices or systems, e.g. in combination with electrical devices, B81C)

11/0006 . {for converting electric switches (H01H 13/564 takes precedence)}
11/0012 . . {for converting normally open to normally closed switches and vice versa}
11/0018 . . {for allowing different operating parts}
2011/0025 . . . {with provisions for allowing different orientation of the operating part, e.g. turning knob can be mounted in different positions}
11/0031 . . {for allowing different types or orientation of connections to contacts}
2011/0037 . . . {with removable or replaceable terminal blocks}
2011/0043 . . {for modifying the number or type of operating positions, e.g. momentary and stable}
11/005 . {of reed switches}
11/0056 . {comprising a successive blank-stamping, insert-moulding and severing operation}
11/0062 . {Testing or measuring non-electrical properties of switches, e.g. contact velocity (monitoring contacts H01H 1/0015; monitoring gas density H01H 33/563; monitoring vacuum H01H 33/668; calibrating H01H 69/01; adjusting H01H 71/74; testing of electrical properties G01R 31/333)}
2011/0068 . . {measuring the temperature of the switch or parts thereof}
2011/0075 . {calibrating mechanical switching properties, e.g. "snap or switch moment", by mechanically deforming a part of the switch, e.g. elongating a blade spring by puncturing it with a laser}
2011/0081 . {using double shot moulding, e.g. for forming elastomeric sealing elements on form stable casing}
2011/0087 . {Welding switch parts by use of a laser beam}
2011/0093 . {Standardization, e.g. limiting the factory stock by limiting the number of unique, i.e. different components}
11/02 . for mercury switches
11/04 . of switch contacts
11/041 . . {by bonding of a contact marking face to a contact body portion}
11/042 . . . {by mechanical deformation}
11/043 . . . {by resistance welding}
11/045 . . . {with the help of an intermediate layer (contacts provided with a solder layer H01H 1/0231)}
2011/046 . . . {by plating}
2011/047 . . . {on both sides of the contact body portion}
11/048 . . {by powder-metallurgical processes}
11/06 . . Fixing of contacts to carrier {; Fixing of contacts to insulating carrier}
2011/062 . . . {by inserting only}
2011/065 . . . {by plating metal or conductive rubber on insulating substrate, e.g. Molded Interconnect Devices [MID]}
2011/067 . . . {by deforming, e.g. bending, folding or caulking, part of the contact or terminal which is being mounted}

13/00 Switches having rectilinearly-movable operating part or parts adapted for pushing or pulling in one direction only, e.g. push-button switch (wherein the operating part is flexible H01H 17/00)

13/02 . Details (specially adapted for rectilinearly movable switches having operating members associated with different sets of contacts, e.g. keyboards, H01H 13/70)
13/023 . . {Light-emitting indicators (for multi-layer switches H01H 13/83)}

2013/026 . . . {with two or more independent lighting elements located inside the push button switch that illuminate separate zones of push buttons}
13/04 . . Cases; Covers
13/06 . . . Dustproof, splashproof, drip-proof, waterproof or flameproof casings
13/063 . . . . {Casings hermetically closed by a diaphragm through which passes an actuating member (vacuum switches H01H 33/66)}
2013/066 . . . . {using bellows}
13/08 . . . Casing of switch constituted by a handle serving a purpose other than the actuation of the switch
13/10 . . Bases; Stationary contacts mounted thereon
13/12 . . Movable parts; Contacts mounted thereon
13/14 . . . Operating parts, e.g. push-button
13/16 . . . . adapted for operation by a part of the human body other than the hand, e.g. by foot
13/18 . . . . adapted for actuation at a limit or other predetermined position in the path of a body, the relative movement of switch and body being primarily for a purpose other than the actuation of the switch, e.g. door switch, limit switch, floor-levelling switch of a lift
13/183 . . . . . {for actuation by moving a closing member, e.g. door, cover (H01H 13/186, H01H 27/002 take precedence; the switch controlling enclosed equipment H01H 9/226)}
13/186 . . . . . {wherein the pushbutton is rectilinearly actuated by a lever pivoting on the housing of the switch}
13/20 . . . Driving mechanisms
13/22 . . . . acting with snap action (depending upon deformation of elastic member H01H 13/26)
13/24 . . . . with means for introducing a predetermined time delay
13/26 . . Snap-action arrangements depending upon deformation of elastic members
13/28 . . . using compression or extension of coil springs
13/285 . . . . {having a symmetrical configuration (H01H 13/30 - H01H 13/34 take precedence)}
13/30 . . . . one end of spring transmitting movement to the contact member when the other end is moved by the operating part
13/32 . . . . one end of spring being fixedly connected to the stationary or movable part of the switch and the other end reacting with a movable or stationary member respectively through pins, cams, toothed or other shaped surfaces
13/34 . . . . having two or more snap-action motions in succession
13/36 . . . using flexing of blade springs
13/365 . . . . {having a symmetrical configuration (H01H 13/38 - H01H 13/46 take precedence)}
13/38 . . . . Single blade moved across dead-centre position
13/40 . . . . Blade spring with at least one snap-acting leg and at least one separate contact-carrying or contact-actuating leg
13/42 . . . . . having three legs
13/44 . . . . having two or more snap-action motions in succession
13/46 . . . . two separate blade springs forming a toggle
13/48 . . . using buckling of disc springs
13/50 . having a single operating member
13/503 . . {Stacked switches}
13/506 . . {with a make-break action in a single operation}
13/52 . . the contact returning to its original state immediately upon removal of operating force, e.g. bell-push switch
2013/525 . . . {using a return spring acting perpendicular to the actuating direction}
13/54 . . the contact returning to its original state a predetermined time interval after removal of operating force, e.g. for staircase lighting
13/56 . . the contact returning to its original state upon the next application of operating force
13/562 . . . {making use of a heart shaped cam}
13/564 . . . . {convertible to momentary push button switches}
2013/566 . . . . . {by removable or exchangeable parts}
13/568 . . . . {the contact also returning by some external action, e.g. interlocking, protection, remote control}
13/58 . . . with contact-driving member rotated step-wise in one direction
13/585 . . . . {wherein the movable contact rotates around the axis of the push button}
13/60 . . . with contact-driving member moved alternately in opposite directions
13/62 . . the contact returning to its original state upon manual release of a latch (latch released by second push-button H01H 13/68)
13/64 . . wherein the switch has more than two electrically distinguishable positions, e.g. multi-position push-button switches
13/66 . . . the operating member having only two positions
13/68 . having two operating members, one for opening and one for closing the same set of contacts (single operating member protruding from different sides of switch casing for alternate pushing upon opposite ends H01H 15/22)
13/70 . having a plurality of operating members associated with different sets of contacts, e.g. keyboard ({keyboards specially adapted for specific applications, see the relevant subclasses or groups, e.g. B41J, G06F 3/023, H04L 17/00, H04M 1/00; multiple switches specially adapted for electromechanical clocks or watches G04C 3/005}; mounting together a plurality of independent switches H02B)
13/7006 . . {comprising a separate movable contact element for each switch site, all other elements being integrated in layers}
13/7013 . . {in which the movable contacts of each switch site or of a row of switch sites are formed in a single plate}
13/702 . . with contacts carried by or formed from layers in a multilayer structure, e.g. membrane switches
13/703 . . . characterised by spacers between contact carrying layers

13/704 . . . characterised by the layers, e.g. by their material or stucture (H01H 13/703 takes precedence)
13/705 . . . characterised by construction, mounting or arrangement of operating parts, e.g. push-buttons or keys
13/7057 . . . . characterised by the arrangement of operating parts in relation to each other, e.g. pre-assembled groups of keys
13/7065 . . . . characterised by the mechanism between keys and layered keyboards
13/7073 . . . . . characterised by springs, e.g. Euler springs
13/72 . . wherein the switch has means for limiting the number of operating members that can concurrently be in the actuated position
13/74 . . . each contact set returning to its original state only upon actuation of another of the operating members
13/76 . . wherein some or all of the operating members actuate different combinations of the contact sets, e.g. ten operating members actuating different combinations of four contact sets
13/78 . . characterised by the contacts or the contact sites
13/785 . . . characterised by the material of the contacts, e.g. conductive polymers
13/79 . . . characterised by the form of the contacts, e.g. interspersed fingers or helical networks
13/80 . . . characterised by the manner of cooperation of the contacts, e.g. with both contacts movable or with bounceless contacts
13/803 . . . characterised by the switching function thereof, e.g. normally closed contacts or consecutive operation of contacts
13/807 . . . characterised by the spatial arrangement of the contact sites, e.g. superimposed sites
13/81 . . characterised by electrical connections to external devices
13/82 . . characterised by contact space venting means
13/83 . . characterised by legends, e.g. Braille, liquid crystal displays, light emitting or optical elements
13/84 . . characterised by ergonomic functions, e.g. for miniature keyboards; characterised by operational sensory functions, e.g. sound feedback (legends H01H 13/83)
13/85 . . . characterised by tactile feedback features
13/86 . . characterised by the casing, e.g. sealed casings or casings reducible in size
13/88 . . Processes specially adapted for manufacture of rectilinearly movable switches having a plurality of operating members associated with different sets of contacts, e.g. keyboards

15/00 Switches having rectilinearly-movable operating part or parts adapted for actuation in opposite directions, e.g. slide switch

15/005 . {adapted for connection with printed circuit boards (in general H01H 1/5805)}
15/02 . Details
15/025 . . {Light-emitting indicators}
15/04 . . Stationary parts; Contacts mounted thereon
15/06 . . Movable parts; Contacts mounted thereon
15/08 . . . Contact arrangements for providing make-before-break operation, e.g. for on-load tap-changing
15/10 . . . Operating parts
15/102 . . . . {comprising cam devices}
15/105 . . . . . {Adjustable cams}
15/107 . . . . . {actuating conventional selfcontained microswitches (H01H 15/105 takes precedence)}
15/12 . . . . adapted for operation by a part of the human body other than the hand, e.g. by foot
15/14 . . . . adapted for actuation at a limit or other predetermined position in the path of a body, the relative movement of switch and body being primarily for a purpose other than the actuation of the switch, e.g. door switch, limit switch, floor-levelling switch of a lift
15/16 . . . Driving mechanisms
15/18 . . . . acting with snap action
15/20 . . . . with means for introducing a predetermined time delay
15/22 . having a single operating part protruding from different sides of switch casing for alternate actuation from opposite ends
15/24 . having a single operating part only protruding from one side of the switch casing for alternate pushing and pulling

17/00 Switches having flexible operating part adapted only for pulling, e.g. cord, chain {(for emergency stop switches H01H 3/0226)}

17/02 . Details
17/04 . . Stationary parts (guides H01H 17/14)
17/06 . . Movable parts (guides H01H 17/14)
17/08 . . . Operating part, e.g. cord
17/10 . . . . adapted for operation by a part of the human body other than the hand, e.g. by foot
17/12 . . . . adapted for actuation at a limit or other predetermined position in the path of a body, the relative movement of switch and body being primarily for a purpose other than the actuation of the switch, e.g. door switch, limit switch, floor-levelling switch of a lift
17/14 . . Guiding means for flexible operating part
17/16 . having a single flexible operating part adapted for pulling at one end only
17/165 . . {secured to a part of the switch mechanism that has only rectilinear movement}
17/18 . . secured to part of the switch driving mechanism that has only angular movement
17/20 . . . the contact returning to its original state immediately upon removal of operating force
17/22 . . . the contact returning to its original state upon the next application of operating force
17/24 . . secured to a part of the switch driving mechanism that has both angular and rectilinear motion
17/26 . having two flexible operating parts; having a single operating part adapted for pulling at both ends
17/28 . . secured to part or parts of the switch driving mechanism having only rectilinear motion
17/30 . . secured to a part or parts of the switch driving mechanism having only angular motion

19/00 Switches operated by an operating part which is rotatable about a longitudinal axis thereof and which is acted upon directly by a solid external to the switch, e.g. by a hand (rotary current collectors, distributors or interrupters H01R 39/00)

19/001 . {Thumb wheel switches}

19/003 . . {having a pushbutton actuator}
19/005 . {Electromechanical pulse generators (integrated in time-pieces G04C 3/007)}
2019/006 . . {being rotation direction sensitive, e.g. the generated pulse or code depends on the direction of rotation of the operating part}
2019/008 . {with snap mounting of rotatable part on fixed part, e.g. rotor on stator, operating knob on switch panel}
19/02 . Details
19/025 . . {Light-emitting indicators}
19/03 . . Means for limiting the angle of rotation of the operating part
19/04 . . Cases; Covers
19/06 . . . Dustproof, splashproof, drip-proof, waterproof, or flameproof casings
19/065 . . . . {Casings hermetically closed by a diaphragm through which passes an actuating member (vacuum switches H01H 33/66)}
19/08 . . Bases; Stationary contacts mounted thereon
19/10 . . Movable parts; Contacts mounted thereon
19/11 . . . with indexing means
19/115 . . . . {using molded elastic parts only}
19/12 . . . Contact arrangements for providing make-before-break operation, e.g. for on-load tap-changing
19/14 . . . Operating parts, e.g. turn knob
2019/143 . . . . {having at least two concentric turn knobs}
2019/146 . . . . {Roller type actuators}
19/16 . . . . adapted for operation by a part of the human body other than the hand, e.g. by foot
19/18 . . . . adapted for actuation at a limit or other predetermined position in the path of a body, the relative movement of switch and body being primarily for a purpose other than the actuation of the switch, e.g. door switch, limit switch, floor-levelling switch of a lift
19/183 . . . . . {adapted for operation by the simultaneous action of two cam plates, rotating at different speeds}
19/186 . . . . . {with travelling nuts}
19/20 . . . Driving mechanisms allowing angular displacement of the operating part to be effective in either direction
19/22 . . . . incorporating lost motion
19/24 . . . . acting with snap action
19/26 . . . . with means for introducing a predetermined time delay
19/28 . . . Driving mechanisms allowing angular displacement of the operating part to be effective or possible in only one direction
19/30 . . . . incorporating lost motion
19/32 . . . . acting with snap action
19/34 . . . . with means for introducing a predetermined time delay
19/36 . the operating part having only two operative positions, e.g. relatively displaced by 180 degrees
19/38 . . Change-over switches
19/40 . . . having only axial contact pressure
19/42 . . providing more than two electrically different conditions, e.g. for closing either or both of two circuits
19/44 . . . having only axial contact pressure
19/46 . the operating part having three operative positions, e.g. off/star/delta
19/48 . . having only axial contact pressure
19/50 . the operating part having four operative positions, e.g. off/two-in-series/one-only/two-in-parallel
19/52 . . having only axial contact pressure
19/54 . the operating part having at least five or an unspecified number of operative positions
19/56 . . Angularly-movable actuating part carrying contacts, e.g. drum switch
19/563 . . . {with an initial separation movement perpendicular to the switching movement}
19/566 . . . {in which the contact making surfaces are inclined, i.e. not perpendicular, to the axial or radial direction}
19/58 . . . having only axial contact pressure, e.g. disc switch, wafer switch
19/585 . . . . {provided with printed circuit contacts}
19/60 . . Angularly-movable actuating part carrying no contacts
19/605 . . . {in which the actuation of the contacts depends on the direction of rotation}
19/62 . . . Contacts actuated by radial cams
19/623 . . . . {Adjustable cams}
19/626 . . . . {actuating bridging contacts (H01H 19/623 takes precedence)}
19/63 . . . Contacts actuated by axial cams (H01H 19/6355 takes precedence)
19/635 . . . Contacts actuated by rectilinearly-movable member linked to operating part, e.g. by pin and slot
19/6355 . . . . {using axial cam devices for transforming the angular movement into linear movement along the axis of rotation}
19/64 . Encased switches adapted for ganged operation when assembled in a line with identical switches, e.g. stacked switches

21/00 **Switches operated by an operating part in the form of a pivotable member acted upon directly by a solid body, e.g. by a hand** (tumbler or rocker switches H01H 23/00; switches having an operating part movable angularly in more than one plane H01H 25/04)

21/02 . Details
21/025 . . {Light-emitting indicators}
21/04 . . Cases; Covers
21/06 . . . interlocked with operating mechanism
21/08 . . . Dustproof, splashproof, drip-proof, waterproof, or flameproof casings
21/085 . . . . {Casings hermetically closed by a diaphragm through which passes an actuating member (vacuum switches H01H 33/66)}
21/10 . . . Casing of switch constituted by a handle serving a purpose other than the actuation of the switch
21/12 . . Bases; Stationary contacts mounted thereon
21/14 . . Means for increasing contact pressure
21/16 . . Adaptation for built-in fuse
21/165 . . . {Fuses mounted on, or constituting the movable contact parts of, the switch}
21/18 . . Movable parts; Contacts mounted thereon
21/20 . . . Contact arrangements for providing make-before-break operation, e.g. for on-load tap-changing
21/22 . . . Operating parts, e.g. handle

2021/225 . . . . {with push-pull operation, e.g. which can be pivoted in both directions by pushing or pulling on the same extremity of the operating member}
21/24 . . . . biased to return to normal position upon removal of operating force
21/245 . . . . . {the contact returning to its original state upon the next application of operating force}
21/26 . . . . . adapted for operation by a part of the human body other than the hand, e.g. by foot
21/28 . . . . . adapted for actuation at a limit or other predetermined position in the path of a body, the relative movement of switch and body being primarily for a purpose other than the actuation of the switch, e.g. door switch, limit switch, floor-levelling switch of a lift
21/282 . . . . . {for actuation by moving a closing member, e.g. door, cover (the switch controlling enclosed equipment H01H 9/226)}
21/285 . . . . . {having an operating arm actuated by the movement of the body and mounted on an axis converting its rotating movement into a rectilinear switch activating movement}
2021/287 . . . . . {with adjustable head, e.g. the actuator head can have different positions in relation to the limit switch itself}
21/30 . . . . not biased to return to a normal position upon removal of operating force
21/32 . . . . . adapted for operation by a part of the human body other than the hand, e.g. by foot
21/34 . . . . . adapted for actuation at a limit or other predetermined position in the path of a body, the relative movement of switch and body being primarily for a purpose other than the actuation of the switch, e.g. door switch, limit switch, floor-levelling switch of a lift
21/36 . . . Driving mechanisms
21/38 . . . . incorporating lost motion
21/40 . . . . having snap action
21/42 . . . . . produced by compression or extension of coil spring
21/44 . . . . . produced by flexing blade springs
21/46 . . . . . with two or more snap-action motions in succession
21/48 . . . . incorporating a ratchet mechanism
21/50 . . . . with indexing or latching means, e.g. indexing by ball and spring; with means to ensure stopping at intermediate operative positions
21/52 . . . . with means for introducing a predetermined time delay
21/54 . Lever switches with blade-type contact co-operating with one or two spring-clip contacts, e.g. knife switch
21/56 . . making contact in one position only
21/58 . . Change-over switches without stable intermediate position
21/60 . . Change-over switches with stable intermediate position
21/86 . Switches with abutting contact carried by operating part, e.g. telegraph tapping key
21/88 . . with intermediate position of rest

23/00 Tumbler or rocker switches, i.e. switches characterised by being operated by rocking an operating member in the form of a rocker button

NOTE

In this group, the term "rocking" is defined as pivotal motion in one plane about an axis parallel to the switch faceplate and located substantially centrally between the ends of the rocker button

23/003 . {with more than one electrically distinguishable condition in one or both positions}
23/006 . {adapted for connection with printed circuit boards (connections to printed circuits in general H01H 1/5805)}
23/02 . Details
23/025 . . {Light-emitting indicators}
23/04 . . Cases; Covers
23/06 . . . Dustproof, splashproof, drip-proof, waterproof, or flameproof casings
23/065 . . . . {Casings hermetically closed by a diaphragm through which passes an actuating member (vacuum switches H01H 33/66)}
23/08 . . Bases; Stationary contacts mounted thereon
23/10 . . Adaptation for built-in fuse
23/105 . . . {Fuses mounted on, or constituting the movable part of, the switch}
23/12 . . Movable parts; Contacts mounted thereon
23/14 . . . Tumblers
23/141 . . . . {provided with extensions, e.g. for actuation by a child}
23/143 . . . . {having a generally flat elongated shape}
23/145 . . . . . {the actuating surface having two slightly inclined areas extending from the middle outward}
23/146 . . . . {having a generally tubular or conical elongated shape, e.g. dolly}
23/148 . . . . {actuated by superimposed sliding element (H01H 23/141 takes precedence)}
23/16 . . . Driving mechanisms
23/162 . . . . {incorporating links interconnecting tumbler and contact arm}
23/164 . . . . {with rectilinearly movable member carrying the contacts}
23/166 . . . . {with positive action}
23/168 . . . . {using cams}
23/18 . . . . incorporating lost motion
23/20 . . . . having snap action
23/205 . . . . . {using a compression spring between tumbler and an articulated contact plate}
23/22 . . . . with means for introducing a predetermined time delay
23/24 . with two operating positions
23/26 . . one of which positions is unstable
23/28 . with three operating positions
23/30 . . with stable centre positions and one or both end positions unstable

25/00 **Switches with compound movement of handle or other operating part**

25/002 . {having an operating member rectilinearly slidable in different directions}

2025/004 . . {the operating member being depressable perpendicular to the other directions}

25/006 . {having an operating member slidable in a plane in one direction and pivotable around an axis located in the sliding plane perpendicular to the sliding direction}

25/008 . {Operating part movable both angularly and rectilinearly, the rectilinear movement being perpendicular to the axis of angular movement}

25/04 . Operating part movable angularly in more than one plane, e.g. joystick

25/041 . . {having a generally flat operating member depressible at different locations to operate different controls}

2025/043 . . . {the operating member being rotatable around wobbling axis for additional switching functions}

2025/045 . . . {having a rotating dial around the operating member for additional switching functions}

2025/046 . . . {having a spherical bearing between operating member and housing or bezel}

2025/048 . . {having a separate central push, slide or tumbler button which is not integral with the operating part that surrounds it}

25/06 . Operating part movable both angularly and rectilinearly, the rectilinear movement being along the axis of angular movement

25/065 . . {using separate operating parts, e.g. a push button surrounded by a rotating knob}

27/00 **Switches operated by a removable member, e.g. key, plug, plate; Switches operated by setting members according to a single predetermined combination out of several possible settings** (locking switch parts to prevent operation H01H 9/28; combined with plug-and-socket connectors H01R; with current-carrying plug H01R 31/08)

27/002 . {wherein one single insertion movement of a key comprises an unlocking stroke and a switch actuating stroke, e.g. security switch for safety guards}

2027/005 . . {the key receiving part having multiple openings to allow keys from different directions to operate the switch}

27/007 . . {the switch being lockable by remote control, e.g. by electromagnet}

27/04 . Insulating plug or plate inserted between normally closed contacts

27/06 . Key inserted and then turned to effect operation of the switch {(IC integrated in key and connected by turning key E05B 49/004)}

27/063 . . {wherein the switch cannot be moved to a third position, e.g. start position, unless the preceding movement was from a first position to a second position, e.g. ignition position (starting of engines and safety devices F02N 11/00; safety means for electric spark ignition F02P 11/00)}

2027/066 . . {having anti-tamper provisions, e.g. avoiding the removal of the lock cylinder}

27/08 . . wherein the key cannot be removed until the switch is returned to its original position {(H01H 27/063, H01H 27/063 take precedence)}

27/10 . Switch operated by setting members according to a single predetermined combination out of several possible settings

29/00 **Switches having at least one liquid contact** (solid contacts wetted or soaked with mercury H01H 1/08)

29/002 . {Inertia switches}

29/004 . {Operated by deformation of container}

29/006 . {Self interrupters, e.g. with periodic or other repetitive opening and closing of contacts}

2029/008 . {using micromechanics, e.g. micromechanical liquid contact switches or [LIMMS]}

29/02 . Details

29/04 . . Contacts; Containers for liquid contacts

29/06 . . . Liquid contacts characterised by the material thereof

29/08 . . Means for introducing a predetermined time delay

29/10 . . . by constricting the flow of the contact liquid

29/12 . . Operating mechanisms adapted for operation by a part of the human body other than the hand, e.g. by foot

29/14 . . Operating mechanisms adapted for actuation at a limit or other predetermined position in the path of a body, the relative movement of switch and body being primarily for a purpose other than the actuation of the switch, e.g. door switch, limit switch, floor-levelling switch of a lift

29/16 . operated by dipping soil contact into stationary contact liquid

29/18 . with level of surface of contact liquid displaced by non-electrical contact-making plunger

29/20 . operated by tilting contact-liquid container (centrifugal mercury switches H01H 29/26)

29/22 . . wherein contact is made and broken between liquid and solid

29/24 . . wherein contact is made and broken between liquid and liquid

29/26 . with level of surface of contact liquid displaced by centrifugal action

29/28 . with level of surface of contact liquid displaced by fluid pressure

29/30 . with level of surface of contact liquid displaced by expansion or evaporation thereof

29/32 . with contact made by a liquid jet, e.g. earthing switch with contact made by jet of water (operated by direct electrodynamic action H01H 53/00)

31/00 **Air-break switches for high tension without arc-extinguishing or arc-preventing means** (in combination with high tension or heavy-current switches with arc-extinguishing or arc-preventing means H01H 33/00; switching arrangements for the supply or distribution of electric power H02B)

31/003 . {Earthing switches (H01H 31/02 - H01H 31/26 take precedence; contact made by liquid jet H01H 29/32; for substations H02B 1/16, H02B 5/01; for withdrawable switchgear H02B 11/28; for gas-insulated switchgear H02B 13/075)}

31/006 . {adapted to be operated by a hot stick; Hot sticks therefor}

31/02 . Details

31/023 . . {Base and stationary contacts mounted thereon}

31/026 . . {Movable parts and contacts mounted thereon}
31/04 . . Interlocking mechanisms (for interlocking with high-tension or heavy-current switches having arc-extinguishing or arc-preventing means H01H 33/52)
31/06 . . . for interlocking between casing, cover, or protective shutter and mechanism for operating contacts
31/08 . . . for interlocking two or more parts of the mechanism for operating contacts
31/10 . . . for interlocking two or more switches (for interlocking with high-tension or heavy-current switches having arc-extinguishing or arc-preventing means H01H 33/52)
31/12 . . Adaptation for built-in fuse
31/122 . . . {Fuses mounted on, or constituting the movable contact parts of, the switch}
31/125 . . . . {with a pivotally supported fuse, hanging on a fixed contact in the open position of the switch (H01H 31/127 takes precedence)}
31/127 . . . . {Drop-out fuses}
31/14 . with bridging contact that is not electrically connected to either line contact in open position of switch
31/16 . . with angularly-movable bridging contact or contact-carrying member
31/18 . . . actuated through the movement of one or more insulators
31/20 . . . . at least one insulator being rotatable about its own geometrical axis
31/22 . . . wherein the contact or contacts are rectilinearly movable with respect to the carrying member
31/24 . . with rectilinearly-movable bridging contact
31/26 . with movable contact that remains electrically connected to one line in open position of switch
31/28 . . with angularly-movable contact
31/283 . . . {wherein the contact or contacts are rectilinearly movable with respect to the carrying member}
2031/286 . . . {wherein the contact is rotatable around its own longitudinal axis}
31/30 . . . actuated through the movement of one or more insulators
31/32 . . with rectilinearly-movable contact
31/34 . with movable contact adapted to engage an overhead transmission line, e.g. for branching
31/36 . . Contact moved by pantograph

33/00 High-tension or heavy-current switches with arc-extinguishing or arc-preventing means

33/002 . {Very heavy-current switches (H01H 33/02 - H01H 33/98 take precedence)}
33/004 . . {making use of superconducting contacts (power cryotrons H01L 39/20; current limitation using superconducting elements H02H 9/023)}
33/006 . {adapted for interrupting fault currents with delayed zero crossings}
33/008 . {Pedestal mounted switch gear combinations}
33/02 . Details
33/021 . . {Use of solid insulating compounds resistant to the contacting fluid dielectrics and their decomposition products, e.g. to SF_6 (insulators or insulating bodies characterised by the insulating materials, selection of materials for their insulating or dielectric properties per se H01B 3/00)}
33/022 . . {particular to three-phase circuit breakers (synchronous switching H01H 9/563)}
2033/024 . . . {with a triangular setup of circuit breakers}
33/025 . . {Terminal arrangements (for vacuum switches H01H 33/6606)}
33/027 . . {Integrated apparatus for measuring current or voltage}
2033/028 . . {the cooperating contacts being both actuated simultaneously in opposite directions}
33/04 . . Means for extinguishing or preventing arc between current-carrying parts (for switches in general H01H 9/30)
33/045 . . . {for arcs formed during closing}
33/06 . . . Insulating body insertable between contacts
33/08 . . . Stationary parts for restricting or subdividing the arc, e.g. barrier plate
2033/085 . . . . {using a flat arc chute, the width of arc chamber being only slightly greater then thickness of switch blade}
33/10 . . . . Metal parts
33/12 . . . Auxiliary contacts on to which the arc is transferred from the main contacts (using arcing horns H01H 33/20)
33/121 . . . . {Load break switches}
33/122 . . . . . {both breaker and sectionaliser being enclosed, e.g. in SF_6-filled container}
33/123 . . . . . {in which the auxiliary contact pivots on the main contact-arm and performs a delayed and accelerated movement}
33/124 . . . . . {the auxiliary contact being a whip contact}
33/125 . . . . . {comprising a separate circuit breaker (H01H 33/122 takes precedence)}
33/126 . . . . . {being operated by the distal end of a sectionalising contact arm}
33/127 . . . . . {movable with a sectionalising contact arm and operated by such movement}
33/128 . . . . . {being operated by a separate mechanism interlocked with the sectionalising mechanism}
33/14 . . . Multiple main contacts for the purpose of dividing the current through, or potential drop along, the arc
33/143 . . . . {of different construction or type}
2033/146 . . . . {using capacitors, e.g. for the voltage division over the different switches}
33/16 . . . Impedances connected with contacts
33/161 . . . . {Variable impedances}
33/162 . . . . . {Liquid resistors}
2033/163 . . . . . {using PTC elements}
33/164 . . . . {the impedance being inserted in the circuit by blowing the arc onto an auxiliary electrode}
33/165 . . . . {Details concerning the impedances (H01H 33/161 takes precedence)}
33/166 . . . . {the impedance being inserted only while closing the switch}

33/167 . . . . {the impedance being inserted only while opening the switch}
33/168 . . . . {the impedance being inserted both while closing and while opening the switch}
33/18 . . . using blow-out magnet {(for vacuum switches H01H 33/664; pressure-generated arcs rotated by a magnetic field H01H 33/982)}
33/182 . . . . {using permanent magnets (H01H 33/187 takes precedence)}
33/185 . . . . {using magnetisable elements associated with the contacts (H01H 33/187 takes precedence)}
33/187 . . . . {comprising a hollow annular arc runner and a central contact between which a radially drawn arc rotates}
33/20 . . . using arcing horns (using blow-out magnet H01H 33/18; arcing horns per se H01T 4/14)
33/22 . . . Selection of fluids for arc-extinguishing
33/24 . . Means for preventing discharge to non-current-carrying parts, e.g. using corona ring
33/245 . . . {using movable field electrodes}
33/26 . . Means for detecting the presence of an arc or other discharge
33/28 . . Power arrangements internal to the switch for operating the driving mechanism
33/285 . . . {using electro-dynamic repulsion (assisting the movement of pistons by accelerating coil H01H 33/882)}
33/30 . . . using fluid actuator
33/302 . . . . {for fluid insulated switchgear, wherein the insulating fluid is also the working fluid}
33/304 . . . . {Working fluid supplies}
2033/306 . . . . {monitoring the pressure of the working fluid, e.g. for protection measures}
2033/308 . . . . {comprising control and pilot valves}
33/32 . . . . pneumatic
33/34 . . . . hydraulic
33/36 . . . using dynamo-electric motor (for storing energy in a spring motor H01H 33/40)
33/38 . . . using electromagnet (for storing energy in a spring motor H01H 33/40)
33/40 . . . using spring motor
33/42 . . Driving mechanisms
33/423 . . . {making use of an electromagnetic wave communication}
2033/426 . . . {Details concerning the connection of the isolating driving rod to a metallic part}
33/44 . . Devices for ensuring operation of the switch at a predetermined point in the ac cycle (circuit arrangements H01H 33/59)
33/46 . . Interlocking mechanisms
33/48 . . . for interlocking between casing or cover and mechanism for operating contacts
33/50 . . . for interlocking two or more parts of the mechanism for operating contacts
33/52 . . . for interlocking two or more switches
33/53 . . Cases (for switchgear H02B 1/26); Reservoirs, tanks, piping or valves, for arc-extinguishing fluid; Accessories therefor, e.g. safety arrangements, pressure relief devices
33/55 . . . Oil reservoirs or tanks; Lowering means therefor (associated with withdrawal mechanism for isolation of switch H02B 11/08)
33/555 . . . . {Protective arrangements responsive to abnormal fluid pressure, liquid level or liquid displacement, e.g. Buchholz relays (circuits H02H 5/08; specially adapted for transformers H01F 27/402)}
33/56 . . . Gas reservoirs
33/561 . . . . {composed of different independent pressurised compartments put in communication only after their assemblage}
33/562 . . . . {Means for avoiding liquefaction or for disposing of liquefaction products}
33/563 . . . . {comprising means for monitoring the density of the insulating gas}
33/565 . . . . {Gas-tight sealings for moving parts penetrating into the reservoir}
2033/566 . . . . {Avoiding the use of SF_6}
2033/567 . . . . {Detection of decomposition products of the gas}
2033/568 . . . . {with overpressure release, e.g. rupture membranes}
33/57 . . . Recuperation of liquid or gas
33/58 . . . Silencers for suppressing noise of switch operation
33/59 . . Circuit arrangements not adapted to a particular application of the switch and not otherwise provided for, e.g. for ensuring operation of the switch at a predetermined point in the ac cycle
33/593 . . . {for ensuring operation of the switch at a predetermined point of the ac cycle (for multipolar switches H01H 9/563)}
33/596 . . . {for interrupting dc}
33/60 . Switches wherein the means for extinguishing or preventing the arc do not include separate means for obtaining or increasing flow of arc-extinguishing fluid
33/62 . . {wherein the break is in air at atmospheric pressure, e.g. in open air}
33/64 . . wherein the break is in gas (in air at atmospheric pressure H01H 33/62; vacuum switches H01H 33/66)
33/66 . . Vacuum switches
33/6606 . . . {Terminal arrangements}
2033/6613 . . . . {Cooling arrangements directly associated with the terminal arrangements}
33/662 . . . Housings or protective screens
33/66207 . . . . {Specific housing details, e.g. sealing, soldering or brazing}
2033/66215 . . . . . {Details relating to the soldering or brazing of vacuum switch housings}
2033/66223 . . . . . {Details relating to the sealing of vacuum switch housings}
2033/6623 . . . . . {Details relating to the encasing or the outside layers of the vacuum switch housings}
33/66238 . . . . {Specific bellows details}
2033/66246 . . . . . {Details relating to the guiding of the contact rod in vacuum switch belows}
2033/66253 . . . . . {Details relating to the prevention of unwanted rotation of the contact rod in vacuum switch bellows}
33/66261 . . . . {Specific screen details, e.g. mounting, materials, multiple screens or specific electrical field considerations}

2033/66269 . . . . . {Details relating to the materials used for screens in vacuum switches}
2033/66276 . . . . . {Details relating to the mounting of screens in vacuum switches}
2033/66284 . . . . . {Details relating to the electrical field properties of screens in vacuum switches}
2033/66292 . . . . . {Details relating to the use of multiple screens in vacuum switches}
33/664 . . . Contacts; Arc-extinguishing means, e.g. arcing rings
33/6641 . . . . {making use of a separate coil}
33/6642 . . . . {having cup-shaped contacts, the cylindrical wall of which being provided with inclined slits to form a coil}
33/6643 . . . . {having disc-shaped contacts subdivided in petal-like segments, e.g. by helical grooves}
33/6644 . . . . {having coil-like electrical connections between contact rod and the proper contact}
33/6645 . . . . . {in which the coil like electrical connections encircle at least once the contact rod}
33/6646 . . . . {having non flat disc-like contact surface}
33/6647 . . . . {having fixed middle contact and two movable contacts}
2033/6648 . . . . {Contacts containing flexible parts, e.g. to improve contact pressure}
33/666 . . . Operating arrangements
33/6661 . . . . {Combination with other type of switch, e.g. for load break switches (H01H 33/143, H01H 33/6662 take precedence)}
33/6662 . . . . {using bistable electromagnetic actuators, e.g. linear polarised electromagnetic actuators}
33/6664 . . . . {with pivoting movable contact structure}
2033/6665 . . . . {Details concerning the mounting or supporting of the individual vacuum bottles}
2033/6667 . . . . {Details concerning lever type driving rod arrangements}
2033/6668 . . . . {with a plurality of interruptible circuit paths in single vacuum chamber}
33/668 . . . Means for obtaining or monitoring the vacuum
33/6683 . . . . {by gettering}
2033/6686 . . . . {by emitting and receiving reflected sound or ultrasound signals}
33/68 . . Liquid-break switches, e.g. oil-break
33/70 . Switches with separate means for directing, obtaining, or increasing flow of arc-extinguishing fluid
33/7007 . . {wherein the flow is a function of the current being interrupted}
33/7015 . . {characterised by flow directing elements associated with contacts (electrical or mechanical properties of the contact system H01H 1/385)}
33/7023 . . . {characterised by an insulating tubular gas flow enhancing nozzle (H01H 33/7038 takes precedence)}
33/703 . . . . {having special gas flow directing elements, e.g. grooves, extensions}
33/7038 . . . {characterised by a conducting tubular gas flow enhancing nozzle}
33/7046 . . . . {having special gas flow directing elements, e.g. grooves, extensions (H01H 33/7053 takes precedence)}
33/7053 . . . . {having a bridging element around two hollow tubular contacts}
33/7061 . . . {characterised by use of special mounting means (H01H 33/7023 - H01H 33/7038 take precedence)}
33/7069 . . . {characterised by special dielectric or insulating properties or by special electric or magnetic field control properties (H01H 33/7023 - H01H 33/7061 take precedence)}
33/7076 . . . {characterised by the use of special materials (H01H 33/7023 - H01H 33/7069 take precedence)}
33/7084 . . . {characterised by movable parts influencing the gas flow (H01H 33/7023 - H01H 33/7076 take precedence)}
33/7092 . . . {characterised by several arcing chambers in series (H01H 33/7023 - H01H 33/7084 take precedence)}
33/72 . . having stationary parts for directing the flow of arc-extinguishing fluid, e.g. arc-extinguishing chamber
33/73 . . . wherein the break is in air at atmospheric pressure, e.g. in open air
33/74 . . . wherein the break is in gas (in air at atmospheric pressure H01H 33/73)
33/75 . . . Liquid-break switches, e.g. oil-break
33/76 . . wherein arc-extinguishing gas is evolved from stationary parts; Selection of material therefor
33/765 . . . {the gas-evolving material being incorporated in the contact material}
33/77 . . . wherein the break is in air at atmospheric pressure
33/78 . . . wherein the break is in gas (in air at atmospheric pressure H01H 33/77)
33/80 . . flow of arc-extinguishing fluid from a pressure source being controlled by a valve
33/82 . . . the fluid being air or gas
33/83 . . . . wherein the contacts are opened by the flow of air or gas
33/84 . . . the fluid being liquid, e.g. oil
33/85 . . . . wherein the contacts are opened by the flow of liquid
33/86 . . the flow of arc-extinguishing fluid under pressure from the contact space being controlled by a valve
33/88 . . the flow of arc-extinguishing fluid being produced or increased by movement of pistons or other pressure-producing parts
33/882 . . . {the movement being assisted by accelerating coils}
33/884 . . . {with variable-area piston}
33/886 . . . {by movement of rotating pistons}
2033/888 . . . {Deflection of hot gasses and arcing products}
33/90 . . . this movement being effected by or in conjunction with the contact-operating mechanism
33/901 . . . . {making use of the energy of the arc or an auxiliary arc}
2033/902 . . . . . {with the gases from hot space and compression volume following different paths to arc space or nozzle, i.e. the compressed gases do not pass through hot volume}

33/903 . . . . . {and assisting the operating mechanism}
33/904 . . . . {characterised by the transmission between operating mechanism and piston or movable contact}
33/905 . . . . {the compression volume being formed by a movable cylinder and a semi-mobile piston}
2033/906 . . . . {with pressure limitation in the compression volume, e.g. by valves or bleeder openings}
2033/907 . . . . {using tandem pistons, e.g. several compression volumes being modified in conjunction or sequential}
2033/908 . . . . {using valves for regulating communication between, e.g. arc space, hot volume, compression volume, surrounding volume}
33/91 . . . . the arc-extinguishing fluid being air or gas
2033/912 . . . . . {Liquified gases, e.g. liquified SF_6}
33/92 . . . . the arc-extinguishing fluid being liquid, e.g. oil
33/94 . . . this movement being effected solely due to the pressure caused by the arc itself or by an auxiliary arc {(H01H 33/903 takes precedence)}
33/95 . . . . the arc-extinguishing fluid being air or gas
33/96 . . . . the arc-extinguishing fluid being liquid, e.g. oil
33/98 . . the flow of arc-extinguishing fluid being initiated by an auxiliary arc or a section of the arc, without any moving parts for producing or increasing the flow {(H01H 33/901 takes precedence)}
33/982 . . . {in which the pressure-generating arc is rotated by a magnetic field}

35/00 Switches operated by change of a physical condition (operated by change of magnetic or electric field H01H 36/00; thermally-actuated switches H01H 37/00; time switches H01H 43/00; relays H01H 45/00 - H01H 61/00; sensing elements for providing continuous conversion of a variable into mechanical displacement G01)

NOTE

A switching device is classified according to that physical condition which, when changed, acts as input to the device, e.g. external explosion causing pressure wave to act upon switch is classified in group H01H 35/24, an explosion produced within the switch in group H01H 37/00 if initiated by heat, in group H01H 39/00 if initiated electrically, and in group H01H 35/14 if initiated by an external blow.

35/003 . {Switches operated by other part of human body than hands (push-button switches H01H 13/16; slide switches H01H 15/20; cord switches H01H 17/10; other switches H01H 19/16 and H01H 21/26)}
35/006 . {Switches operated by mechanical overload condition, e.g. transmitted force or torque becoming too high}
35/02 . Switches operated by change of position, inclination or orientation of the switch itself in relation to gravitational field (tilting mercury container H01H 29/20; change of position due to change of liquid level H01H 35/18; {specially adapted for electromechanical clocks or watches G04C 3/002})
35/022 . . {the switch being of the reed switch type}
35/025 . . {the switch being discriminative in different directions}
35/027 . . {the inertia mass activating the switch mechanically, e.g. through a lever}
35/06 . Switches operated by change of speed (operated by change of fluid flow H01H 35/24)
35/10 . . Centrifugal switches (level of mercury displaced by centrifugal action H01H 29/26)
35/12 . . operated by reversal of direction of movement
35/14 . Switches operated by change of acceleration, e.g. by shock or vibration, inertia switch {(wherein the liquid constitutes a contact of the switch H01H 29/002)}
35/141 . . {Details}
35/142 . . . {Damping means to avoid unwanted response}
35/143 . . . {Resetting means}
35/144 . . {operated by vibration}
35/145 . . {operated by a particular acceleration-time function}
35/146 . . {operated by plastic deformation or rupture of structurally associated elements}
35/147 . . {the switch being of the reed switch type}
35/148 . . {making use of a rolamite sensor}
35/18 . Switches operated by change of liquid level or of liquid density, e.g. float switch (wherein the liquid constitutes a contact of the switch H01H 29/00; by magnet carried on a float H01H 36/02)
35/183 . . {making use of a thermal switch}
35/186 . . {making use of a cable suspended floater containing an inclination sensing switch}
35/24 . Switches operated by change of fluid pressure, by fluid pressure waves, or by change of fluid flow (wherein the change of pressure is caused by change of temperature H01H 37/36)
35/242 . . {operated by one particular pressure-time function}
35/245 . . {actuated by the deformation of a body of elastic material}
35/247 . . {the switch being of the reed switch type}
35/26 . . Details
35/2607 . . . {Means for adjustment of "ON" or "OFF" operating pressure (means for adjustment of "ON" or "OFF" operating temperature of thermally actuated switches by varying bias on the thermal element due to a separate spring H01H 37/18)}
35/2614 . . . . {by varying the bias on the pressure sensitive element}
35/2621 . . . . . {the bias being magnetic}
35/2628 . . . . {by varying the relative position of switch-casing and pressure sensitive element}
35/2635 . . . . {by adjustment of a motion transmitting system}
35/2642 . . . . . {comprising a lost-motion connection}
35/265 . . . . {by adjustment of one of the co-operating contacts}
35/2657 . . . {with different switches operated at substantially different pressures}
35/2664 . . . . {making use of a balance plate pivoting about different axes}
35/2671 . . . {Means to detect leaks in the pressure sensitive element}
35/2678 . . . {Means to isolate oscillating component of pressure}

35/2685 . . . {Means to protect pressure sensitive element against over pressure}
35/2692 . . . {comprising pneumatic snap-action}
35/28 . . . Compensation for variation of ambient pressure or temperature
35/30 . . . Means for transmitting pressure to pressure-responsive operating part, e.g. by capsule and capillary tube
35/32 . . actuated by bellows
35/34 . . actuated by diaphragm
35/343 . . . {by snap acting diaphragm}
35/346 . . . {in which the movable contact is formed or directly supported by the diaphragm}
35/36 . . actuated by curled flexible tube, e.g. Bourdon tube
35/38 . . actuated by piston and cylinder
35/40 . . actuated by devices allowing continual flow of fluid, e.g. vane
35/405 . . . {the switch being of the reed switch type}
35/42 . Switches operated by change of humidity

36/00 Switches actuated by change of magnetic field or of electric field, e.g. by change of relative position of magnet and switch, by shielding {(specially adapted for electromechanical clocks or watches G04C 3/004)**}**

36/0006 . {Permanent magnet actuating reed switches (H01H 35/147 takes precedence)}
36/0013 . . {characterised by the co-operation between reed switch and permanent magnet; Magnetic circuits}
36/002 . . . {Actuation by moving ferromagnetic material, switch and magnet being fixed}
36/0026 . . . {comprising a biasing, helping or polarising magnet}
36/0033 . . {Mountings; Housings; Connections}
36/004 . . {push-button-operated, e.g. for keyboards}
36/0046 . . {Limit switches, also fail-safe operation or anti-tamper considerations}
36/0053 . . {periodically operated}
36/006 . . {comprising a plurality of reed switches, e.g. selectors or joystick-operated}
36/0066 . . {magnet being removable, e.g. part of key pencil}
36/0073 . {actuated by relative movement between two magnets}
36/008 . {Change of magnetic field wherein the magnet and switch are fixed, e.g. by shielding or relative movements of armature (for reed switches H01H 36/002)}
2036/0086 . {Movable or fixed contacts formed by permanent magnets}
2036/0093 . {Micromechanical switches actuated by a change of the magnetic field}
36/02 . actuated by movement of a float carrying a magnet

37/00 Thermally-actuated switches (electrothermal relays operated by electrical input H01H 61/00; protective switches with electrothermal release or actuation H01H 73/00 - H01H 83/00)

37/002 . {combined with protective means}
37/004 . {with thermal image}
37/006 . {with different switches operated at substantially different temperatures}
2037/008 . {Micromechanical switches operated thermally}
37/02 . Details
37/04 . . Bases; Housings; Mountings {(H01H 37/5427 takes precedence)}
37/043 . . . {Mountings on controlled apparatus}
2037/046 . . . {being soldered on the printed circuit to be protected}
37/06 . . . to facilitate replacement, e.g. cartridge housing
37/08 . . Indicators; Distinguishing marks
37/10 . . Compensation for variation of ambient temperature or pressure
37/12 . . Means for adjustment of "on" or "off" operating temperature
37/14 . . . by anticipatory electric heater
37/16 . . . by varying the proportion of input heat received by the thermal element, e.g. by displacement of a shield
37/18 . . . by varying bias on the thermal element due to a separate spring
37/20 . . . by varying the position of the thermal element in relation to switch base or casing
37/22 . . . by adjustment of a member transmitting motion from the thermal element to contacts or latch
37/24 . . . by adjustment of position of the movable contact on its driving member
37/26 . . . by adjustment of abutment for "off" position of the movable contact
37/28 . . . by adjustment of the position of the fixed contact
37/30 . . . by varying the position of the contact unit in relation to switch base or casing
37/32 . . Thermally-sensitive members (temperature responsive elements in general G01K)
37/323 . . . {making use of shape memory materials (in thermal relays H01H 61/0107; release mechanism H01H 71/145; treatment of SMF alloys C22F 1/006; in general G01K 5/483, G12B 1/00; for control of temperature G05D 23/024)}
2037/326 . . . {with radiative heat transfer to the switch, e.g. special absorption surfaces}
37/34 . . . Means for transmitting heat thereto, e.g. capsule remote from contact member
37/36 . . . actuated due to expansion or contraction of a fluid with or without vaporisation (the fluid forming a contact of the switch H01H 29/04, H01H 29/30)
37/38 . . . . with bellows
37/40 . . . . with diaphragm
37/42 . . . . with curled flexible tube, e.g. Bourdon tube
37/44 . . . . with piston and cylinder
37/46 . . . actuated due to expansion or contraction of a solid (deflection of a bimetallic element H01H 37/52)
37/48 . . . . with extensible rigid rods or tubes
37/50 . . . . with extensible wires under tension
37/52 . . . actuated due to deflection of bimetallic element
37/521 . . . . {comprising a plurality of bimetals acting in the same direction}
2037/523 . . . . {using a corrugated bimetal}
2037/525 . . . . {Details of manufacturing of the bimetals, e.g. connection to non bimetallic elements or insulating coatings}
2037/526 . . . . {Materials for bimetals}
2037/528 . . . . {the bimetallic element being composed of more than two layers}

37/54 . . . . wherein the bimetallic element is inherently snap acting
37/5409 . . . . . {Bistable switches; Resetting means}
37/5418 . . . . . {using cantilevered bimetallic snap elements}
37/5427 . . . . . {encapsulated in sealed miniaturised housing}
37/5436 . . . . . {mounted on controlled apparatus}
2037/5445 . . . . . {with measures for avoiding slow break of contacts during the creep phase of the snap bimetal}
2037/5454 . . . . . {with separate spring biasing the bimetal snap element against the heat transfer surface}
2037/5463 . . . . . {the bimetallic snap element forming part of switched circuit}
2037/5472 . . . . . {having an omega form, e.g. the bimetallic snap element having a ring shape with a central tongue}
2037/5481 . . . . . {the bimetallic snap element being mounted on the contact spring}
2037/549 . . . . . {Details of movement transmission between bimetallic snap element and contact}
37/56 . . . . having spirally wound or helically wound bimetallic element
37/58 . . . actuated due to thermally controlled change of magnetic permeability
37/585 . . . . {the switch being of the reed switch type}
37/60 . . Means for producing snap action (inherent in bimetallic element H01H 37/54; caused by a magnet H01H 37/66)
37/62 . . Means other than thermal means for introducing a predetermined time delay
37/64 . . Contacts
37/66 . . . Magnetic reinforcement of contact pressure; Magnet causing snap action
37/68 . . . sealed in evacuated or gas-filled tube
37/70 . . . Resetting means {(H01H 37/5409 takes precedence)}
2037/705 . . . . {wherein the switch cannot be closed when the temperature is above a certain value}
37/72 . Switches in which the opening movement and the closing movement of a contact are effected respectively by heating and cooling or vice versa
37/74 . Switches in which only the opening movement or only the closing movement of a contact is effected by heating or cooling (for the electrical protection of electric lines or electric apparatus H01H 73/00 - H01H 83/00)
37/76 . . Contact member actuated by melting of fusible material, actuated due to burning of combustible material or due to explosion of explosive material (fuses H01H 85/00)
37/761 . . . {with a fusible element forming part of the switched circuit (H01H 37/767 takes precedence)}
2037/762 . . . . {using a spring for opening the circuit when the fusible element melts}
2037/763 . . . . . {the spring being a blade spring}
37/764 . . . {in which contacts are held closed by a thermal pellet}
37/765 . . . . {using a sliding contact between a metallic cylindrical housing and a central electrode}
37/766 . . . . {using a bridging contact}
37/767 . . . {Normally open}
2037/768 . . . {characterised by the composition of the fusible material}
2037/769 . . . {characterised by the composition of insulating fusible materials, e.g. for use in the thermal pellets}

39/00 Switching devices actuated by an explosion produced within the device and initiated by an electric current
39/002 . {provided with a cartridge-magazine}
39/004 . {Closing switches}
39/006 . {Opening by severing a conductor}
2039/008 . {using the switch for a battery cutoff}

41/00 Switches providing a selected number of consecutive operations of the contacts by a single manual actuation of the operating part (for telephone communication H04M 1/26)
41/04 . Switches without means for setting or mechanically storing a multidigit number
41/06 . . dial or slide operated
41/08 . . keyboard operated
41/10 . Switches with means for setting or mechanically storing a multidigit number
41/12 . . dial or slide operated
41/14 . . keyboard operated

43/00 Time or time-programme switches providing a choice of time intervals for executing one or more switching actions and automatically terminating their operations after the programme is completed (clocks with attached or built-in means operating any device at preselected times or after preselected time-intervals G04C 23/00; {apparatus which can be set and started to measure-off predetermined intervals G04F 3/06}; programme-control systems G05B 19/00)
43/005 . {with timing of the actuation of contacts due to a part rotating at variable speed}
43/02 . Details
43/022 . . {Bases; Housings; Mountings}
43/024 . . {Terminal arrangements (in general H01H 1/58)}
43/026 . . {Contact arrangements}
43/028 . . {Means for manually actuating the contacts or interfering with the cooperation between timer mechanism and contacts}
43/04 . . Means for time setting
43/06 . . . comprising separately adjustable parts for each programme step, e.g. with tappets
43/065 . . . . {using cams or discs supporting a plurality of individually programmable elements (Schaltreiter)}
43/08 . . . comprising an interchangeable programme part which is common for all programme steps, e.g. with a punched card
43/10 . with timing of actuation of contacts due to a part rotating at substantially constant speed
43/101 . . {Driving mechanisms}
43/102 . . . {using a pawl and ratchet wheel mechanism}
43/103 . . {stopping automatically after one preselected time interval}
43/104 . . . {by mechanical coupling device}
43/105 . . . {by electromechanical coupling device}

43/106 . . {Manual programme selecting means}
2043/107 . . . {Bidirectional selecting means, e.g. the program selecting knob being turnable in both directions}
2043/108 . . {where at least some contacts of electromechanical timer give instructions to electronic timer and/or the timing motor is under control of electronic timer, e.g. hybrid timer}
43/12 . . stopping automatically after a single cycle of operation
43/121 . . . {using a drum}
43/122 . . . . {with provision for adjustment of the intervals by a non-rotating member}
43/124 . . . {using a disc}
43/125 . . . {using a cam}
43/127 . . . . {with provision for adjustment of the intervals by means carried by the cam}
43/128 . . . . {with provision for adjustment of the intervals by a non-rotating member}
43/14 . . . wherein repetition of operation necessitates resetting of time intervals
43/16 . . stopping automatically after a predetermined plurality of cycles of operation
43/24 . with timing of actuation of contacts due to a non-rotatable moving part
43/26 . . the actuation being produced by a substance flowing due to gravity, e.g. sand, water
43/28 . . the actuation being produced by a part, the speed of which is controlled by fluid-pressure means, e.g. by piston and cylinder
43/285 . . . {adjusting the time interval by means of an adjustable orifice, e.g. needle valve}
43/30 . with timing of actuation of contacts due to thermal action
43/301 . . {based on the expansion or contraction of a material (thermometers based on the expansion or contraction of a material G01K 5/00)}
43/302 . . . {of solid bodies}
43/303 . . . . {of one single solid body, e.g. hot wire}
43/304 . . . . {of two bodies expanding or contracting in a different manner, e.g. bimetallic elements}
43/305 . . . . . {actuating the contacts by commanding a mechanical device, e.g. thermal motor}
43/306 . . . {of liquids}
43/307 . . . {of gases}
43/308 . . {based on the change of electrical properties, e.g. thermistors (thermometers based on the use of electric or magnetic elements directly sensitive to heat G01K 7/00)}
43/309 . . {based on the change of magnetic properties (thermometers based on the use of electric or magnetic elements directly sensitive to heat G01K 7/00)}
43/32 . with timing of actuation of contacts due to electrolytic processes; with timing of actuation of contacts due to chemical processes
43/322 . . {Electrolytic decomposition of liquids, e.g. actuation of contacts due to action of the products of reaction}
43/325 . . {Electrolytic decomposition of solid bodies, e.g. action by rupture}
43/327 . . {acting by coulometric transfer of material}

Relays

45/00 **Details of relays** (electric circuit arrangements H01H 47/00; of electromagnetic relays H01H 50/00; details of electrically-operated selector switches H01H 63/00 {; testing of relays G01R 31/00; relays for emergency protective circuit arrangements H02H})
45/02 . Bases; Casings; Covers (frames for mounting two or more relays or for mounting a relay and another electric component H02B 1/01, H04Q 1/08, H05K)
45/04 . . Mounting complete relay or separate parts of relay on a base or inside a case
45/06 . . having windows; Transparent cases or covers
45/08 . Indicators; Distinguishing marks
45/10 . Electromagnetic or electrostatic shielding (casings H01H 45/02 {; screening in general H05K 9/00})
45/12 . Ventilating; Cooling; Heating (for operating electrothermal relays H01H 61/013)
45/14 . Terminal arrangements

47/00 **Circuit arrangements not adapted to a particular application of the relay and designed to obtain desired operating characteristics or to provide energising current** (circuit arrangements for electro-magnets in general H01F 7/18)
47/001 . {Functional circuits, e.g. logic, sequencing, interlocking circuits}
47/002 . {Monitoring or fail-safe circuits}
2047/003 . . {Detecting welded contacts and applying weld break pulses to coil}
47/004 . . {using plural redundant serial connected relay operated contacts in controlled circuit}
47/005 . . . {Safety control circuits therefor, e.g. chain of relays mutually monitoring each other}
2047/006 . . {Detecting unwanted movement of contacts and applying pulses to coil for restoring to normal status}
47/007 . {with galvanic isolation between controlling and controlled circuit, e.g. transformer relay}
2047/008 . {with a drop in current upon closure of armature or change of inductance}
2047/009 . {with self learning features, e.g. measuring the attracting current for a relay and memorising it}
47/02 . for modifying the operation of the relay
2047/025 . . {with taking into account of the thermal influences, e.g. change in resistivity of the coil or being adapted to high temperatures}
47/04 . . for holding armature in attracted position, e.g. when initial energising circuit is interrupted; for maintaining armature in attracted position, e.g. with reduced energising current {(with switching regulator H01H 47/325)}
47/043 . . . {making use of an energy accumulator (for bistable relays H01H 47/226)}
2047/046 . . . {with measuring of the magnetic field, e.g. of the magnetic flux, for the control of coil current}
47/06 . . . by changing number of serially-connected turns or windings
47/08 . . . by changing number of parallel-connected turns or windings
47/10 . . . by switching-in or -out impedance external to the relay winding
47/12 . . for biasing the electromagnet

47/14 . . for differential operation of the relay
47/16 . . for conjoint, e.g. additive, operation of the relay
47/18 . . for introducing delay in the operation of the relay (short-circuited conducting sleeves, bands or discs H01H 50/46)
47/20 . . for producing frequency-selective operation of the relay
47/22 . for supplying energising current for relay coil
47/223 . . {adapted to be supplied by AC}
47/226 . . {for bistable relays}
47/24 . . having light-sensitive input
47/26 . . having thermo-sensitive input
47/28 . . Energising current supplied by discharge tube
47/30 . . . by gas-filled discharge tube
47/32 . . Energising current supplied by semiconductor device
47/325 . . . {by switching regulator}
47/34 . . Energising current supplied by magnetic amplifier {(magnetic amplifiers H03F 9/00)}
47/36 . . Relay coil or coils forming part of a bridge circuit

49/00 Apparatus or processes specially adapted to the manufacture of relays or parts thereof

50/00 Details of electromagnetic relays ({H01H 51/28 takes precedence;} electric circuit arrangements H01H 47/00; details of electrically-operated select or switches H01H 63/00; {testing of relays G01R 31/00; electromagnets in general H01F 7/06; relays for emergency protective circuit arrangements H02H})
50/002 . {particular to three-phase electromagnetic relays (synchronous switching H01H 9/563)}
50/005 . {using micromechanics}
2050/007 . . {Relays of the polarised type, e.g. the MEMS relay beam having a preferential magnetisation direction}
50/02 . Bases; Casings; Covers (frames for mounting two or more relays or for mounting a relay and another electric component H02B 1/01, H04Q 1/08, H05K)
50/021 . . {structurally combining a relay and an electronic component, e.g. varistor, RC circuit (auxiliary switch inserting resistor during closure H01H 50/543)}
50/023 . . {Details concerning sealing, e.g. sealing casing with resin (in general H01H 9/04)}
2050/025 . . . {containing inert or dielectric gasses, e.g. SF_6, for arc prevention or arc extinction}
50/026 . . {Details concerning isolation between driving and switching circuit}
2050/028 . . {Means to improve the overall withstanding voltage, e.g. creepage distances}
50/04 . . Mounting complete relay or separate parts of relay on a base or inside a case
50/041 . . . {Details concerning assembly of relays}
50/042 . . . . {Different parts are assembled by insertion without extra mounting facilities like screws, in an isolated mounting part, e.g. stack mounting on a coil-support}
50/043 . . . . {Details particular to miniaturised relays (H01H 50/042 takes precedence)}
2050/044 . . . . . {Special measures to minimise the height of the relay}
50/045 . . . . {Details particular to contactors (H01H 50/042 takes precedence)}
2050/046 . . . . {Assembling parts of a relay by using snap mounting techniques}
50/047 . . . {Details concerning mounting a relays}
50/048 . . . . {Plug-in mounting or sockets}
2050/049 . . . {Assembling or mounting multiple relays in one common housing}
50/06 . . having windows; Transparent cases or covers
50/08 . Indicators; Distinguishing marks
50/10 . Electromagnetic or electrostatic shielding (casings H01H 50/02 {; screening in general H05K 9/00})
50/12 . Ventilating; Cooling; Heating (for operating electrothermal relays H01H 61/013)
50/14 . Terminal arrangements {(for coils H01H 50/443)}
50/16 . Magnetic circuit arrangements (cores, yokes, or armatures in general H01F 3/00; magnets in general H01F 7/00)
50/163 . . {Details concerning air-gaps, e.g. anti-remanence, damping, anti-corrosion}
2050/166 . . {wherein the magnetic circuit parts are molded in a magnetic plastic material}
50/18 . . Movable parts of magnetic circuits, e.g. armature
50/20 . . . movable inside coil and substantially lengthwise with respect to axis thereof; movable coaxially with respect to coil
50/22 . . . . wherein the magnetic circuit is substantially closed
2050/225 . . . . . {with yoke and armature formed by identical stacked laminates, e.g. punched in one and the same tool}
50/24 . . . Parts rotatable or rockable outside coil
50/26 . . . . Parts movable about a knife edge
50/28 . . . . Parts movable due to bending of a blade spring or reed
50/30 . . . Mechanical arrangements for preventing or damping vibration or shock, e.g. by balancing of armature
50/305 . . . . {damping vibration due to functional movement of armature (in air-gap H01H 50/163)}
50/32 . . . Latching movable parts mechanically
50/321 . . . . {the mechanical latch being controlled directly by the magnetic flux or part of it}
50/323 . . . . {for interlocking two or more relays (in general H01H 9/26)}
2050/325 . . . . . {Combined electrical and mechanical interlocking, e.g. usually for auxiliary contacts}
50/326 . . . . {with manual intervention, e.g. for testing, resetting or mode selection}
2050/328 . . . . . {with manual locking means having three positions, e.g. on-off-automatic}
50/34 . . . Means for adjusting limits of movement; Mechanical means for adjusting returning force
50/36 . . Stationary parts of magnetic circuit, e.g. yoke
2050/362 . . . {Part of the magnetic circuit conducts current to be switched or coil current, e.g. connector and magnetic circuit formed of one single part}
2050/365 . . . {formed from a single sheet of magnetic material by punching, bending, plying}
2050/367 . . . {Methods for joining separate core and L-shaped yoke}
50/38 . . . Part of main magnetic circuit shaped to suppress arcing between the contacts of the relay

50/40 . . . Branched or multiple-limb main magnetic circuits

50/42 . . . Auxiliary magnetic circuits, e.g. for maintaining armature in, or returning armature to, position of rest, for damping or accelerating movement

50/44 . Magnetic coils or winding (circuit arrangements H01H 47/00; in general H01F 5/00)

50/443 . . {Connections to coils}

2050/446 . . {Details of the insulating support of the coil, e.g. spool, bobbin, former}

50/46 . . Short-circuited conducting sleeves, bands, or discs {(for electromagnets H01F 7/1205)}

50/54 . Contact arrangements (contacts for switches in general H01H 1/00)

50/541 . . {Auxiliary contact devices (in general H01H 9/0066)}

50/543 . . . {Auxiliary switch inserting resistor during closure of contactor}

50/545 . . . {Self-contained, easily replaceable microswitches}

50/546 . . {for contactors having bridging contacts}

50/548 . . {for miniaturised relays}

50/56 . . Contact spring sets

50/58 . . . Driving arrangements structurally associated therewith; Mounting of driving arrangements on armature

50/60 . . moving contact being rigidly combined with movable part of magnetic circuit {(for polarised relays H01H 51/2254, H01H 51/2281)}

50/62 . . Co-operating movable contacts operated by separate electrical actuating means

50/64 . Driving arrangements between movable part of magnetic circuit and contact (structurally associated with contact spring sets H01H 50/58)

50/641 . . {intermediate part performing a rectilinear movement (H01H 50/645, H01H 50/66 - H01H 50/74 take precedence)}

50/642 . . . {intermediate part being generally a slide plate, e.g. a card}

50/643 . . {intermediate part performing a rotating or pivoting movement (H01H 50/645, H01H 50/66 - H01H 50/74 take precedence)}

50/644 . . . {having more than one rotating or pivoting part}

50/645 . . {intermediate part making a resilient or flexible connection (H01H 50/66 - H01H 50/74 take precedence)}

50/646 . . . {intermediate part being a blade spring}

50/647 . . {intermediate part comprising interlocking means for different contact pairs (H01H 50/66 - H01H 50/74 take precedence; for two separate relays H01H 50/323; for ratchets H01H 51/08)}

50/648 . . {intermediate part being rigidly combined with armature (H01H 50/66 - H01H 50/74 take precedence)}

50/66 . . with lost motion

50/68 . . with snap action

50/70 . . operating contact momentarily during stroke of armature

50/72 . . for mercury contact

50/74 . . Mechanical means for producing a desired natural frequency of operation of the contacts, e.g. for self-interrupter

50/76 . . . using reed or blade spring

50/78 . . . using diaphragm; using stretched wire or ribbon vibrating sideways

50/80 . . . using torsionally-vibrating member, e.g. wire, strip

50/82 . . . using spring-loaded pivoted inertia member

50/84 . . . with means for adjustment of frequency or of make-to-break ratio

50/86 . Means for introducing a predetermined time delay between the initiation of the switching operation and the opening or closing of the contacts (circuit arrangements for introducing delay H01H 47/18; short-circuited conducting sleeves, bands, or discs H01H 50/46)

50/88 . . Mechanical means, e.g. dash-pot

50/90 . . . the delay effective in both directions of operation

50/92 . . Thermal means (inherent in electrothermal relays H01H 61/00)

51/00 Electromagnetic relays (relays using the dynamo-electric effect H01H 53/00)

51/005 . {Inversing contactors (H01H 50/323 takes precedence)}

51/01 . Relays in which the armature is maintained in one position by a permanent magnet and freed by energisation of a coil producing an opposing magnetic field {(H01H 51/02 - H01H 51/26 take precedence)}

51/02 . Non-polarised relays

51/04 . . with single armature; with single set of ganged armatures

51/06 . . . Armature is movable between two limit positions of rest and is moved in one direction due to energisation of an electromagnet and after the electromagnet is de-energised is returned by energy stored during the movement in the first direction, e.g. by using a spring, by using a permanent magnet, by gravity {(motors with armature moved one way and returned by spring in general H02K 33/02)}

51/065 . . . . {Relays having a pair of normally open contacts rigidly fixed to a magnetic core movable along the axis of a solenoid, e.g. relays for starting automobiles (details H01H 50/20)}

51/08 . . . . Contacts alternately opened and closed by successive cycles of energisation and de-energisation of the electromagnet, e.g. by use of a ratchet

51/082 . . . . . {using rotating ratchet mechanism}

51/084 . . . . . {with axial ratchet elements}

51/086 . . . . . {with radial ratchet elements}

51/088 . . . . . {moved alternately in opposite directions}

51/10 . . . . Contacts retained open or closed by a latch which is controlled by an electromagnet

51/12 . . . Armature is movable between two limit positions of rest and is moved in both directions due to the energisation of one or the other of two electromagnets without the storage of energy to effect the return movement {(motors with armature moved one way and returned by spring in general H02K 33/02)}

51/14 . . . . without intermediate neutral position of rest

51/16 . . . . with intermediate neutral position of rest

51/18 . . . Armature is rotatable through an unlimited number of revolutions

51/20 . . with two or more independent armatures

51/22 . Polarised relays {(H01H 51/28 takes precedence)}

51/2209 . . {with rectilinearly movable armature}

2051/2218 . . . {having at least one movable permanent magnet}

51/2227 . . {in which the movable part comprises at least one permanent magnet, sandwiched between pole-plates, each forming an active air-gap with parts of the stationary magnetic circuit (H01H 51/2209 takes precedence)}

51/2236 . . {comprising pivotable armature, pivoting at extremity or bending point of armature (H01H 51/2227 takes precedence)}

51/2245 . . . {Armature inside coil}

51/2254 . . . . {Contact forms part of armature}

51/2263 . . {comprising rotatable armature, rotating around central axis perpendicular to the main plane of the armature (H01H 51/2227 takes precedence)}

51/2272 . . {comprising rockable armature, rocking movement around central axis parallel to the main plane of the armature (H01H 51/2227 takes precedence)}

51/2281 . . . {Contacts rigidly combined with armature}

51/229 . . . . {Blade-spring contacts alongside armature}

51/24 . . without intermediate neutral position of rest

51/26 . . with intermediate neutral position of rest

51/27 . Relays with armature having two stable magnetic states and operated by change from one state to the other

51/28 . Relays having both armature and contacts within a sealed casing outside which the operating coil is located, e.g. contact carried by a magnetic leaf spring or reed (H01H 51/27 takes precedence)

51/281 . . {Mounting of the relay; Encapsulating; Details of connections}

51/282 . . {Constructional details not covered by H01H 51/281}

51/284 . . {Polarised relays (polarised relays in general H01H 51/22)}

51/285 . . . {for latching of contacts}

51/287 . . {Details of the shape of the contact springs}

51/288 . . {Freely suspended contacts}

51/29 . Relays having armature, contacts, and operating coil within a sealed casing (H01H 51/27 takes precedence)

51/30 . specially adapted for actuation by alternating current

51/32 . . Frequency relays; Mechanically-tuned relays {(switched devices for electric time devices G04C; electromechanical resonaters H03H 9/00; telegraph circuits with oscillating relay H04L 25/205; mechanical means for producing a desired natural frequency of operation of the contacts H01H 50/74)}

51/34 . Self-interrupters, i.e. with periodic or other repetitive opening and closing of contacts

51/36 . . wherein the make-to-break ratio is varied by hand setting or current strength

53/00 Relays using the dynamo-electric effect, i.e. relays in which contacts are opened or closed due to relative movement of current-carrying conductor and magnetic field caused by force of interaction between them

53/01 . Details

53/015 . . Moving coils; Contact-driving arrangements associated therewith

53/02 . Electrodynamic relays, i.e. relays in which the interaction is between two current-carrying conductors

53/04 . . Ferrodynamic relays, i.e. relays in which the magnetic field is concentrated in ferromagnetic parts

53/06 . Magnetodynamic relays, i.e. relays in which the magnetic field is produced by a permanent magnet

53/08 . wherein a mercury contact constitutes the current-carrying conductor

53/10 . Induction relays, i.e. relays in which the interaction is between a magnetic field and current induced thereby in a conductor {(parts of protective circuit arrangements H02H 1/00)}

53/12 . . Ferraris relays

53/14 . Contacts actuated by an electric motor through fluid-pressure transmission, e.g. using a motor-driven pump {(switches using dynamo-electric motor H01H 3/26)}

55/00 Magnetostrictive relays

57/00 Electrostrictive relays; Piezo-electric relays

2057/003 . {the relay being latched in actuated position by magnet}

2057/006 . {Micromechanical piezoelectric relay}

59/00 Electrostatic relays; Electro-adhesion relays ({electrostatic measuring instruments G01R 5/28}; clutches in general using the Johnson-Rahbek effect H02N 13/00; {electrostatic transducers H04R 19/00; systems for preventing the formation of electrostatic charges H05F})

59/0009 . {making use of micromechanics}

2059/0018 . . {Special provisions for avoiding charge trapping, e.g. insulation layer between actuating electrodes being permanently polarised by charge trapping so that actuating or release voltage is altered}

2059/0027 . . {Movable electrode connected to ground in the open position, for improving isolation}

2059/0036 . . {Movable armature with higher resonant frequency for faster switching}

2059/0045 . . {with s-shaped movable electrode, positioned and connected between two driving fixed electrodes, e.g. movable electrodes moving laterally when driving voltage being applied}

2059/0054 . . {Rocking contacts or actuating members}
2059/0063 . . {with stepped actuation, e.g. actuation voltages applied to different sets of electrodes at different times or different spring constants during actuation}
2059/0072 . . {with stoppers or protrusions for maintaining a gap, reducing the contact area or for preventing stiction between the movable and the fixed electrode in the attracted position}
2059/0081 . . {with a tapered air-gap between fixed and movable electrodes}
2059/009 . {using permanently polarised dielectric layers}

61/00 **Electrothermal relays** (thermal switches not operated by electrical input, thermal switches with anticipating electrical input H01H 37/00; thermally-sensitive members H01H 37/32)
61/002 . {Structural combination of a time delay electrothermal relay with an electrothermal protective relay, e.g. a start relay}
2061/004 . . {PTC resistor in series with start winding, e.g. adapted for being switched off after starting for limiting power dissipation}
2061/006 . {Micromechanical thermal relay}
2061/008 . . {Micromechanical actuator with a cold and a hot arm, coupled together at one end}
61/01 . Details
61/0107 . . {making use of shape memory materials (in general H01H 37/323)}
2061/0115 . . . {Shape memory alloy [SMA] actuator formed by coil spring}
2061/0122 . . . {Two SMA actuators, e.g. one for closing or resetting contacts and one for opening them}
61/013 . . Heating arrangements for operating relays
61/017 . . . Heating by glow discharge or arc in confined space
61/02 . wherein the thermally-sensitive member is heated indirectly, e.g. resistively, inductively
61/04 . wherein the thermally-sensitive member is only heated directly
61/06 . Self-interrupters, i.e. with periodic or other repetitive opening and closing of contacts
61/063 . . {making use of a bimetallic element}
61/066 . . {making use of an extensible wire, rod or strips}
61/08 . . wherein the make-to-break ratio is varied by hand setting or current strength

Selectors

63/00 **Details of electrically-operated selector switches** (details of relays H01H 45/00)
63/02 . Contacts; Wipers; Connections thereto
63/04 . . Contact-making or contact-breaking wipers; Position indicators therefor
63/06 . . Contact banks
63/08 . . . cylindrical
63/10 . . . plane
63/12 . . Multiplying connections to contact banks, e.g. using ribbon cables
63/14 . . . without soldering
63/16 . Driving arrangements for multi-position wipers
63/18 . . with step-by-step motion of wiper to a selector position
63/20 . . . using stepping magnet and ratchet
63/22 . . . using step-by-step electromagnetic drive without ratchet, e.g. self-interrupting driving magnet
63/24 . . with continuous motion of wiper until a selected position is reached
63/26 . . . with an individual clutch-drive from a shaft common to more than one selector switch
63/28 . . . with an individual motor for each selector switch
63/30 . . . . Pneumatic motor for moving wiper to selected position
63/32 . . . . Spring motor for moving wiper to selected position
63/33 . Constructional details of co-ordinate-type selector switches not having relays at cross-points
63/34 . Bases; Cases; Covers; Mountings (racks for mounting selectors with or without other exchange equipment H04Q 1/04); Mounting of fuses on selector switch
63/36 . Circuit arrangements for ensuring correct or desired operation and not adapted to a particular application of the selector switch
63/38 . . for multi-position wiper switches
63/40 . . for multi-position switches without wipers
63/42 . . . for co-ordinate-type selector switches not having relays at cross-points

65/00 **Apparatus or processes specially adapted to the manufacture of selector switches or parts thereof**

67/00 **Electrically-operated selector switches** (details thereof H01H 63/00; selecting in general H04Q)
67/02 . Multi-position wiper switches
67/04 . . having wipers movable only in one direction for purpose of selection
67/06 . . . Rotary switches, i.e. having angularly movable wipers
67/08 . . . . with wiper selection
67/10 . . . . with coarse and fine positioning of wipers
67/12 . . . Linear-motion switches
67/14 . . having wipers movable in two mutually perpendicular directions for purpose of selection
67/16 . . . one motion being rotary and the other being parallel to the axis of rotation, e.g. Strowger or "up and around" switches
67/18 . . . one motion being rotary and the other being perpendicular to the axis of rotation, e.g. "round and in" switches
67/20 . . . both motions being linear
67/22 . Switches without multi-position wipers
67/24 . . Co-ordinate-type relay switches having an individual electromagnet at each cross-point
67/26 . . Co-ordinate-type selector switches not having relays at cross-points but involving mechanical movement, e.g. cross-bar switch, code-bar switch
67/30 . . Co-ordinate-type selector switches with field of co-ordinate coil acting directly upon magnetic leaf spring or reed-type contact member
67/32 . . having a multiplicity of interdependent armatures operated in succession by a single coil and each controlling one contact or set of contacts, e.g. counting relay

Emergency protective devices

69/00 **Apparatus or processes for the manufacture of emergency protective devices** (manufacture of switches in general H01H 11/00; manufacture of relays in general H01H 49/00)

69/01 . for calibrating or setting of devices to function under predetermined conditions (measuring electric values G01R)

2069/013 . . {with calibrating screws in trip bar}

2069/016 . . {with single separate parts mountable or insertable in different orientations or positions, e.g. to obtain desired trip conditions}

69/02 . Manufacture of fuses

69/022 . . {of printed circuit fuses}

2069/025 . . {using lasers}

2069/027 . . {using ultrasonic techniques}

71/00 **Details of the protective switches or relays covered by groups H01H 73/00 - H01H 83/00**

71/002 . {with provision for switching the neutral conductor}

2071/004 . . {with a tripping or current sensing device in the neutral wire, e.g. for third harmonics in a three fase system}

2071/006 . {Provisions for user interfaces for electrical protection devices}

2071/008 . {Protective switches or relays using micromechanics}

71/02 . Housings; Casings; Bases; Mountings

71/0207 . . {Mounting or assembling the different parts of the circuit breaker}

71/0214 . . . {Housing or casing lateral walls containing guiding grooves or special mounting facilities (H01H 71/0221 takes precedence)}

71/0221 . . . {Majority of parts mounted on central frame or wall}

71/0228 . . . {having provisions for interchangeable or replaceable parts}

71/0235 . . . {Contacts and the arc extinguishing space inside individual separate cases, which are positioned inside the housing of the circuit breaker (casettes for rotating bridges see H01H 1/2058)}

2071/0242 . . . {Assembling parts of a circuit breaker by using snap mounting techniques}

71/025 . . {Constructional details of housings or casings not concerning the mounting or assembly of the different internal parts}

71/0257 . . . {Strength considerations}

71/0264 . . {Mountings or coverplates for complete assembled circuit breakers, e.g. snap mounting in panel}

71/0271 . . . {Mounting several complete assembled circuit breakers together (interconnected mechanisms H01H 71/1009)}

2071/0278 . . . . {with at least one of juxtaposed casings dedicated to an auxiliary device, e.g. for undervoltage or shunt trip}

2071/0285 . . . . {Provisions for an intermediate device between two adjacent circuit breakers having the same general contour but an auxiliary function, e.g. cooling, isolation, wire guiding, magnetic isolation or screening}

2071/0292 . . {Housing or frames containing grooves or slots for guiding movable parts}

71/04 . Means for indicating condition of the switching device {(by means of an auxiliary contact H01H 71/46)}

2071/042 . . {with different indications for different conditions, e.g. contact position, overload, short circuit or earth leakage}

2071/044 . . {Monitoring, detection or measuring systems to establish the end of life of the switching device, can also contain other on-line monitoring systems, e.g. for detecting mechanical failures}

2071/046 . . {exclusively by position of operating part, e.g. with additional labels or marks but no other movable indicators}

2071/048 . . {containing non-mechanical switch position sensor, e.g. HALL sensor}

71/06 . Distinguishing marks, e.g. colour coding

71/08 . Terminals; Connections (in general H01R)

71/082 . . {Connections between juxtaposed circuit breakers}

2071/084 . . {specially adapted for avoiding decalibration of trip unit, e.g. bimetal, when fixing conductor wire to connector}

2071/086 . . {Low power connections for auxiliary switches, e.g. shunt trip}

2071/088 . . {Terminals for switching devices which make the devices interchangeable, e.g. with fuses}

71/10 . Operating or release mechanisms

71/1009 . . {Interconnected mechanisms (H01H 71/1045 takes precedence; operated by excess current and other electrical conditions H01H 83/20)}

71/1018 . . . {with only external interconnections}

71/1027 . . . {comprising a bidirectional connecting member actuated by the opening movement of one pole to trip a neighbour pole}

2071/1036 . . . {having provisions for four or more poles}

71/1045 . . {Multiple circuits-breaker, e.g. for the purpose of dividing current or potential drop}

71/1054 . . {Means for avoiding unauthorised release}

2071/1063 . . . {making use of an equilibrating mass}

71/1072 . . {Release mechanisms which are reset by opening movement of contacts}

71/1081 . . {Modifications for selective or back-up protection; Correlation between feeder and branch circuit breaker (circuits H02H 3/06, H02H 7/26)}

2071/109 . . {with provisions for selecting between automatic or manual reset}

71/12 . . Automatic release mechanisms with or without manual release

71/121 . . . {Protection of release mechanisms (with auxiliary contact H01H 71/48)}

71/122 . . . {actuated by blowing of a fuse}

71/123 . . . {using a solid-state trip unit (circuits H02H)}

2071/124 . . . . {with a hybrid structure, the solid state trip device being combined with a thermal or a electromagnetic trip}

71/125 . . . . {characterised by sensing elements, e.g. current transformers (for differential protection H01H 83/144)}

71/126 . . . {actuated by dismounting of circuit breaker or removal of part of circuit breaker}

71/127 . . . {using piezoelectric, electrostrictive or magnetostrictive trip units}

71/128 . . . {Manual release or trip mechanisms, e.g. for test purposes (two similar push buttons for closing or resetting and opening or tripping H01H 71/58; test switches for earth fault circuit breakers H01H 83/04)}
71/14 . . . Electrothermal mechanisms {(combined with a electro-thermal time delay relay H01H 61/002)}
71/142 . . . . {actuated due to change of magnetic permeability}
71/145 . . . . {using shape memory materials (H01H 71/16 takes precedence; in general H01H 37/323)}
2071/147 . . . . {Thermal release by expansion of a fluid}
71/16 . . . . with bimetal element {(combined with detection of imbalance of two or more currents H01H 83/223)}
71/161 . . . . . {with helically or spirally wound bimetal}
71/162 . . . . . {with compensation for ambient temperature}
71/164 . . . . . {Heating elements}
2071/165 . . . . . {the bimetal being inductively heated, e.g. load current does not pass through bimetal}
2071/167 . . . . . {Multiple bimetals working in parallel together, e.g. laminated together}
2071/168 . . . . . {Provisions for avoiding permanent deformation and thus decalibration of bimetal, e.g. due to overheating or action of a magnet}
71/18 . . . . with expanding rod, strip, or wire
71/20 . . . . with fusible mass
71/205 . . . . . {using a ratchet wheel kept against rotation by solder}
71/22 . . . . with compensation for variation of ambient temperature {(H01H 71/162 takes precedence)}
71/24 . . . Electromagnetic mechanisms
71/2409 . . . . {combined with an electromagnetic current limiting mechanism}
71/2418 . . . . {combined with an electrodynamic current limiting mechanism}
2071/2427 . . . . . {with blow-off movement tripping mechanism, e.g. electrodynamic effect on contacts trips the traditional trip device before it can unlatch the spring mechanism by itself}
71/2436 . . . . {with a holding and a releasing magnet, the holding force being limited due to saturation of the holding magnet}
71/2445 . . . . {using a reed switch (reed switches in general H01H 51/28; for current measuring G01R 19/16509)}
71/2454 . . . . {characterised by the magnetic circuit or active magnetic elements}
71/2463 . . . . {with plunger type armatures}
71/2472 . . . . {with rotatable armatures}
71/2481 . . . . {characterised by the coil design}
2071/249 . . . . {with part of the magnetic circuit being in the normal current path in the circuit breaker, e.g. yoke, fixed contact and arc-runner are made out of one single conductive element}
71/26 . . . . with windings acting in opposition {(H01H 71/2436 takes precedence)}
71/28 . . . . with windings acting in conjunction
71/30 . . . . having additional short-circuited winding
71/32 . . . . having permanently magnetised part
71/321 . . . . . {characterised by the magnetic circuit or active magnetic elements}
71/322 . . . . . {with plunger type armature}
71/323 . . . . . {with rotatable armature}
71/325 . . . . . {Housings, assembly or disposition of different elements in the housing}
71/326 . . . . . {Sealed housings}
71/327 . . . . . {Manufacturing or calibrating methods, e.g. air gap treatments}
2071/328 . . . . . {using a spring for having minimal force on armature while maximal force on trip pin}
71/34 . . . . having two or more armatures controlled by a common winding
71/345 . . . . . {having a delayed movable core and a movable armature}
71/36 . . . . frequency selective
71/38 . . . . wherein the magnet coil also acts as arc blow-out device
71/40 . . . Combined electrothermal and electromagnetic mechanisms
71/402 . . . . {in which the thermal mechanism influences the magnetic circuit of the electromagnetic mechanism}
71/405 . . . . {in which a bimetal forms the inductor for the electromagnetic mechanism}
2071/407 . . . . {the thermal element being heated by the coil of the electromagnetic mechanism}
71/42 . . . Induction-motor, induced-current, or electrodynamic release mechanisms
71/43 . . . . Electrodynamic release mechanisms
71/44 . . . having means for introducing a predetermined time delay (by short-circuited winding H01H 71/30; by additional armature H01H 71/34)
71/443 . . . . {with dash-pot}
71/446 . . . . {making use of an inertia mass}
71/46 . . . having means for operating auxiliary contacts additional to the main contacts
71/462 . . . . {housed in a separate casing, juxtaposed to and having the same general contour as the main casing (for neutral conductor H01H 71/002)}
71/465 . . . . {Self-contained, easily replaceable microswitches}
2071/467 . . . . {with history indication, e.g. of trip and/or kind of trip, number of short circuits etc.}
71/48 . . . . with provision for short-circuiting the electrical input to the release mechanism after release of the switch, e.g. for protection of heating wire
71/50 . . Manual reset mechanisms {which may be also used for manual release}
71/501 . . . {Means for breaking welded contacts; Indicating contact welding or other malfunction of the circuit breaker}
2071/502 . . . . {with direct contact between manual operator and welded contact structure}
71/503 . . . {Means for increasing the opening stroke of the contacts}
71/504 . . . {provided with anti-rebound means (for switches in general H01H 1/50)}

71/505 . . . {Latching devices between operating and release mechanism}
2071/506 . . . . {using balls or rollers in the latching device}
2071/507 . . . . {being collapsible, e.g. yielding elastically, when the opening force is higher than a predetermined value}
2071/508 . . . . {with serial latches, e.g. primary latch latched by secondary latch for requiring a smaller trip force}
71/52 . . . actuated by lever
71/521 . . . . {Details concerning the lever handle}
71/522 . . . . {comprising a cradle-mechanism}
71/523 . . . . . {the contact arm being pivoted on cradle and mechanism spring acting between handle and contact arm}
71/524 . . . . . {the contact arm being pivoted on handle and mechanism spring acting between cradle and contact arm}
71/525 . . . . . {comprising a toggle between cradle and contact arm and mechanism spring acting between handle and toggle knee}
71/526 . . . . {the lever forming a toggle linkage with a second lever, the free end of which is directly and releasably engageable with a contact structure}
71/527 . . . . {making use of a walking beam with one extremity latchable, the other extremity actuating or supporting the movable contact and an intermediate part co-operating with the actuator}
71/528 . . . . {comprising a toggle or collapsible link between handle and contact arm, e.g. sear pin mechanism}
71/529 . . . . {comprising an electroresponsive element forming part of the transmission chain between handle and contact arm}
71/54 . . . actuated by tumbler
71/56 . . . actuated by rotatable knob or wheel
2071/565 . . . . {using a add on unit, e.g. a separate rotary actuator unit, mounted on lever actuated circuit breakers}
71/58 . . . actuated by push-button, pull-knob, or slide
71/60 . . . actuated by closure of switch casing
71/62 . . . with means for preventing resetting while abnormal condition persists, e.g. loose handle arrangement
71/64 . . . . incorporating toggle linkage
71/66 . . Power reset mechanisms
2071/665 . . . {the reset mechanism operating directly on the normal manual operator, e.g. electromagnet pushes manual release lever back into "ON" position}
71/68 . . . actuated by electromagnet
71/685 . . . . {in which the excitation of the electromagnet is interrupted by abnormal conditions}
71/70 . . . actuated by electric motor
71/72 . . . actuated automatically a limited number of times
71/74 . Means for adjusting the conditions under which the device will function to provide protection
71/7409 . . {Interchangeable elements}
71/7418 . . {Adjusting both electrothermal and electromagnetic mechanism}
71/7427 . . {Adjusting only the electrothermal mechanism}
71/7436 . . . {Adjusting the position (or prestrain) of the bimetal (H01H 71/7445 takes precedence)}
71/7445 . . . {Poly-phase adjustment}
2071/7454 . . . {with adjustable axis of transmission lever between bimetal element and trip lever}
71/7463 . . {Adjusting only the electromagnetic mechanism}
2071/7472 . . {with antitamper means for avoiding unauthorised setting}
2071/7481 . . {with indexing means for magnetic or thermal tripping adjustment knob}
2071/749 . . {with a shunt element connected in parallel to magnetic or thermal trip elements, e.g. for adjusting trip current}

73/00 Protective overload circuit-breaking switches in which excess current opens the contacts by automatic release of mechanical energy stored by previous operation of a hand reset mechanism

73/02 . Details
73/04 . . Contacts
73/045 . . . {Bridging contacts (specific details for the contacting bridge per se H01H 1/20 and subgroups, e.g. rotating bridge H01H 1/2041)}
73/06 . . Housings; Casings; Bases; Mountings
73/08 . . . Plug-in housings {(for a plurality of juxtaposed housings H02B 1/056)}
73/10 . . . Cartridge housings, e.g. screw-in housing
73/12 . . Means for indicating condition of the switch {(by means of an auxiliary contact H01H 71/46)}
73/14 . . . Indicating lamp structurally associated with the switch
73/16 . . Distinguishing marks, e.g. colour coding
73/18 . . Means for extinguishing or suppressing arc {(in general H01H 9/30 - H01H 9/46; magnet coil acting as blow-out device H01H 71/38)}
73/20 . . Terminals; Connections (in general H01R)
73/22 . having electrothermal release and no other automatic release (cartridge type H01H 73/62)
73/24 . . reset by lever
73/26 . . reset by tumbler
73/28 . . reset by rotatable knob or wheel
73/30 . . reset by push-button, pull-knob or slide
73/303 . . . {with an insulating body insertable between the contacts when released by a bimetal element}
73/306 . . . {the push-button supporting pivotally a combined contact-latch lever}
73/32 . . reset by closure of switch casing
73/34 . . reset action requiring replacement or reconditioning of a fusible or explosive part
73/36 . having electromagnetic release and no other automatic release (cartridge type H01H 73/64)
73/38 . . reset by lever
73/40 . . reset by tumbler
73/42 . . reset by rotatable knob or wheel
73/44 . . reset by push-button, pull-knob or slide
73/46 . . reset by closure of switch casing
73/48 . having both electrothermal and electromagnetic automatic release (cartridge type H01H 73/66)
73/50 . . reset by lever
73/52 . . reset by tumbler
73/54 . . reset by rotatable knob or wheel
73/56 . . reset by push-button, pull-knob or slide
73/58 . . reset by closure of switch casing
73/60 . cartridge type, e.g. screw-in cartridge

73/62 . . having only electrothermal release
73/64 . . having only electromagnetic release
73/66 . . having combined electrothermal and electromagnetic release

75/00 Protective overload circuit-breaking switches in which excess current opens the contacts by automatic release of mechanical energy stored by previous operation of power reset mechanism

75/02 . Details
75/04 . . Reset mechanisms for automatically reclosing a limited number of times (circuit arrangements H02H 3/06)
75/06 . . . effecting one reclosing action only
75/08 . having only electrothermal release
75/10 . having only electromagnetic release
75/12 . having combined electrothermal and electromagnetic release

77/00 Protective overload circuit-breaking switches operated by excess current and requiring separate action for resetting (H01H 73/00, H01H 75/00 take precedence)

77/02 . in which the excess current itself provides the energy for opening the contacts, and having a separate reset mechanism
2077/025 . . {with pneumatic means, e.g. by arc pressure}
77/04 . . with electrothermal opening
77/06 . . with electromagnetic opening {(combined with electromagnetic release mechanism H01H 71/2409)}
77/08 . . . retained closed by permanent or remanent magnetism and opened by windings acting in opposition
77/10 . . with electrodynamic opening {(combined with electromagnetic release mechanism H01H 71/2418)}
77/101 . . . {with increasing of contact pressure by electrodynamic forces before opening}
77/102 . . . {characterised by special mounting of contact arm, allowing blow-off movement}
77/104 . . . . {with a stable blow-off position}
77/105 . . . . {whereby the blow-off movement unlatches the contact from a contact holder}
77/107 . . . {characterised by the blow-off force generating means, e.g. current loops}
77/108 . . . . {comprising magnetisable elements, e.g. flux concentrator, linear slot motor}

79/00 Protective switches in which excess current causes the closing of contacts, e.g. for short-circuiting the apparatus to be protected {(H01H 39/004 takes precedence)**}**

81/00 Protective switches in which contacts are normally closed but are repeatedly opened and reclosed as long as a condition causing excess current persists, e.g. for current limiting

81/02 . electrothermally operated
81/04 . electromagnetically operated

83/00 Protective switches, e.g. circuit-breaking switches, or protective relays operated by abnormal electrical conditions otherwise than solely by excess current

83/02 . operated by earth fault currents (H01H 83/14 takes precedence)
83/04 . . with testing means for indicating the ability of the switch or relay to function properly
2083/045 . . . {Auxiliary switch opening testing circuit in synchronism with the main circuit}
83/06 . operated by current falling below a predetermined value
83/08 . operated by reversal of dc
83/10 . operated by excess voltage, e.g. for lightning protection
83/12 . operated by voltage falling below a predetermined value, e.g. for no-volt protection
83/14 . operated by unbalance of two or more currents or voltages, e.g. for differential protection
83/142 . . {with bimetal elements}
83/144 . . {with differential transformer}
2083/146 . . . {Provisions for avoiding disadvantages of having asymetrical primaries, e.g. induction of a magnetic field even by zero difference current}
2083/148 . . . {with primary windings formed of rigid copper conductors}
83/16 . operated by abnormal ratio of voltage and current, e.g. distance relay
83/18 . operated by abnormal product of, or abnormal phase angle between, voltage and current, e.g. directional relay
83/20 . operated by excess current as well as by some other abnormal electrical condition
2083/201 . . {the other abnormal electrical condition being an arc fault}
2083/203 . . {with shunt trip circuits, e.g. NC contact in an undervoltage coil circuit}
2083/205 . . {having shunt or UVR tripping device with integrated mechanical energy accumulator}
2083/206 . . {with thermal shunt trip}
2083/208 . . {Converting under voltage release [UVR] and shunt release}
83/22 . . the other condition being unbalance of two or more currents or voltages
83/223 . . . {with bimetal elements}
83/226 . . . {with differential transformer}

85/00 Protective devices in which the current flows through a part of fusible material and this current is interrupted by displacement of the fusible material when this current becomes excessive (switches actuated by melting of fusible material H01H 37/76; automatic release of protective switches due to fusion of a mass H01H 73/00 - H01H 83/00; disposition or arrangement of fuses on boards H02B 1/18)

2085/0004 . {making use of shape-memory material}
2085/0008 . {making use of heat shrinkable material}
85/0013 . {Means for preventing damage, e.g. by ambient influences to the fuse}
85/0017 . . {due to vibration or other mechanical forces, e.g. centrifugal forces}
85/0021 . . {water or dustproof devices}
85/0026 . . . {casings for the fuse and its base contacts}
85/003 . . . {casings for the fusible element}
2085/0034 . . . {with molded casings}

85/0039 . {Means for influencing the rupture process of the fusible element}
85/0043 . . {Boiling of a material associated with the fusible element, e.g. surrounding fluid}
85/0047 . . {Heating means}
85/0052 . . . {Fusible element and series heating means or series heat dams}
85/0056 . . . {Heat conducting or heat absorbing means associated with the fusible member, e.g. for providing time delay}
85/006 . . . {Heat reflective or insulating layer on the casing or on the fuse support}
85/0065 . . . {Heat reflective or insulating layer on the fusible element}
85/0069 . . . {Heat reflective or insulating filler, support, or block forming the casing}
85/0073 . . {Expansion or rupture of the insulating support for the fusible element}
85/0078 . {Security-related arrangements}
85/0082 . . {preventing explosion of the cartridge}
85/0086 . . . {use of a flexible body, e.g. inside the casing}
85/0091 . . {providing disconnection of the neutral line}
85/0095 . . {Earthing means}
85/02 . Details (electrical connections in general H01R)
85/0208 . . {Tools for inserting and removing fuses}
2085/0216 . . {Tools for controlling fuses or the line associated with the fuses}
2085/0225 . . {Means for preventing discharge, e.g. corona ring}
2085/0233 . . {with common casing for fusible elements inserted in more than one phase or more than one circuit}
85/0241 . . {Structural association of a fuse and another component or apparatus (switches with built-in fuses H01H 9/10, spark-gap arresters H01H 85/44, transformers and inductances H01F 27/402, capacitors H01G 2/14, lamps H01K 1/66, semiconductors H01L 23/5256 or H01L 23/62)}
2085/025 . . . {Structural association with a binding post of a storage battery}
2085/0258 . . . {Structural association of a fuse or a fuse holder with a bimetallic element}
2085/0266 . . . {Structural association with a measurement device, e.g. a shunt}
2085/0275 . . . {Structural association with a printed circuit board}
2085/0283 . . . {Structural association with a semiconductor device}
2085/0291 . . . {Structural association with a current transformer}
85/04 . . Fuses, i.e. expendable parts of the protective device, e.g. cartridges
85/041 . . . characterised by the type
85/0411 . . . . {Miniature fuses}
2085/0412 . . . . . {specially adapted for being mounted on a printed circuit board}
2085/0414 . . . . . {Surface mounted fuses}
85/0415 . . . . . {cartridge type}
85/0417 . . . . . {with parallel side contacts}
85/0418 . . . . . {with ferrule type end contacts}
85/042 . . . . General constructions or structure of high voltage fuses, i.e. above 1000 V
85/044 . . . . General constructions or structure of low voltage fuses, i.e. below 1000 V, or of fuses where the applicable voltage is not specified (H01H 85/046 - H01H 85/048 take precedence)
85/0445 . . . . . fast or slow type (H01H 85/045 - H01H 85/048 take precedence)
85/045 . . . . . cartridge type
85/0452 . . . . . {with parallel side contacts}
85/0454 . . . . . {with screw-in type contacts}
85/0456 . . . . . {with knife-blade end contacts}
85/0458 . . . . . {with ferrule type end contacts}
85/046 . . . . Fuses formed as printed circuits
85/047 . . . . Vacuum fuses
85/048 . . . . Fuse resistors
2085/0483 . . . . . {with temperature dependent resistor, e.g. thermistor}
2085/0486 . . . . . {with voltage dependent resistor, e.g. varistor}
85/05 . . . Component parts thereof
85/055 . . . . Fusible members
2085/0555 . . . . . {Input terminal connected to a plurality of output terminals, e.g. multielectrode}
85/06 . . . . . characterised by the fusible material (H01H 85/11 takes precedence)
85/08 . . . . . characterised by the shape or form of the fusible member
85/10 . . . . . with constriction for localised fusing (H01H 85/11 takes precedence)
85/11 . . . . . with applied local area of a metal which, on melting, forms a eutectic with the main material of the fusible member, i.e. M-effect devices
85/12 . . . . . Two or more separate fusible members in parallel
85/143 . . . . Electrical contacts; Fastening fusible members to such contacts
85/147 . . . . . Parallel-side contacts
85/15 . . . . . Screw-in contacts
85/153 . . . . . Knife-blade-end contacts
85/157 . . . . . Ferrule-end contacts
85/165 . . . . Casings (electrical contacts H01H 85/143; fillings H01H 85/18)
85/17 . . . . . characterised by the casing material
85/175 . . . . . characterised by the casing shape or form
85/1755 . . . . . {composite casing}
85/18 . . . . Casing fillings, e.g. powder
85/185 . . . . . {Insulating members for supporting fusible elements inside a casing, e.g. for helically wound fusible elements}
85/20 . . Bases for supporting the fuse; Separate parts thereof (bases, casings for connectors, in general H01R)
85/2005 . . . {for use with screw-in type fuse}
85/201 . . . {for connecting a fuse in a lead and adapted to be supported by the lead alone}
85/2015 . . . {for plug-in type fuses}
85/202 . . . {for fuses with ferrule type end contacts}
85/2025 . . . {for fuses with conical end contacts, e.g. fuses used on motor vehicles}
85/203 . . . {for fuses with blade type terminals}

85/2035 . . . . {for miniature fuses with parallel side contacts}
85/204 . . . . {for low voltage fuses with knife-blade end contacts}
85/2045 . . . {Mounting means or insulating parts of the base, e.g. covers, casings}
85/205 . . . {Electric connections to contacts on the base}
2085/2055 . . . . {Connections to bus bars in an installation with screw in type fuses or knife blade fuses}
2085/206 . . . . {being tappable, e.g. terminals on the fuse or base being arranged so as to permit an additional connector to be engaged therewith}
2085/2065 . . . {with base contacts adapted or adaptable to fuses of different lenghts; bases with self-aligning contacts; intermediate adaptation pieces}
2085/207 . . . {Bases adapted to fuses with different end contacts or to other components, e.g. circuit breakers; intermediate adaptation pieces}
2085/2075 . . . {Junction box, having holders integrated with several other holders in a particular wiring layout}
2085/208 . . . . {specially adapted for vehicles}
2085/2085 . . . {Holders for mounting a fuse on a printed circuit}
2085/209 . . . {Modular assembly of fuses or holders, e.g. side by side; combination of a plurality of identical fuse units}
2085/2095 . . . {Triangular setup of fuses, e.g. for space saving}
85/22 . . Intermediate or auxiliary parts for carrying, holding, or retaining fuse, cooperating with base or fixed holder, and removable therefrom for renewing the fuse
85/24 . . Means for preventing insertion of incorrect fuse
85/25 . . Safety arrangements preventing or inhibiting contact with live parts, including operation of isolation on removal of cover (interlocking between casing or protective shutter of a switch and mechanism for operating its contacts H01H 9/22)
85/26 . . Magazine arrangements
85/263 . . . {with spare printed circuit fuse}
2085/266 . . . {with replacement of a fuse which is part of a printed circuit}
85/28 . . . effecting automatic replacement
85/30 . . Means for indicating condition of fuse structurally associated with the fuse
85/303 . . . {Movable indicating elements}
85/306 . . . . {acting on an auxiliary switch or contact}
85/32 . . . Indicating lamp structurally associated with the protective device
85/34 . . Distinguishing marks, e.g. colour coding
85/36 . . Means for applying mechanical tension to fusible member
85/38 . . Means for extinguishing or suppressing arc (by powder filling H01H 85/18; by mechanical tension applied to fusible member H01H 85/36)
2085/381 . . . {with insulating body insertable between the end contacts of the fusible element}
2085/383 . . . {with insulating stationary parts}
2085/385 . . . {Impedances connected with the end contacts of the fusible element}
2085/386 . . . {with magnetic or electrodynamic arc-blowing}
2085/388 . . . {using special materials}
85/40 . . . using an arc-extinguishing liquid (characterised by the composition of the liquid H01H 33/22)
85/42 . . . using an arc-extinguishing gas (characterised by the composition of the gas H01H 33/22)
85/43 . . Means for exhausting or absorbing gases liberated by fusing arc, or for ventilating excess pressure generated by heating
85/44 . . Structural association with a spark-gap arrester
85/46 . . Circuit arrangements not adapted to a particular application of the protective device
85/463 . . . {with printed circuit fuse}
2085/466 . . . {with remote controlled forced fusing}
85/47 . . Means for cooling
85/48 . Protective devices wherein the fuse is carried or held directly by the base
85/485 . . {the fuse being provided with bayonet-type locking means}
85/50 . . the fuse having contacts at opposite ends for co-operation with the base
85/52 . . the fuse being adapted for screwing into the base
85/54 . Protecting devices wherein the fuse is carried, held or retained by an intermediate or auxiliary part removable from the base, or used as sectionalisers
85/542 . . {the intermediate or auxiliary part being provided with bayonet-type locking means}
85/545 . . {with pivoting fuse carrier (tumbler switch with built-in fuse H01H 23/10)}
85/547 . . {with sliding fuse carrier}
85/56 . . the intermediate or auxiliary part having side contacts for plugging into the base, e.g. bridge-carrier type
85/58 . . . with intermediate or auxiliary part and base shaped to interfit and thereby enclose the fuse
85/60 . . the intermediate or auxiliary part having contacts at opposite ends for co-operation with the base
85/62 . . the intermediate or auxiliary part being adapted for screwing into the base

87/00 Protective devices in which a current flowing through a liquid or solid is interrupted by the evaporation of the liquid or by the melting and evaporation of the solid when the current becomes excessive, the circuit continuity being reestablished on cooling

89/00 Combinations of two or more different basic types of electric switches, relays, selectors and emergency protective devices, not covered by a single one of the preceding main groups

2089/005 . {Multi-purpose combinations, e.g. LS/DI, LS/FI, of normal protective circuit breakers with known other forms of protection, e.g. earthfaults, differential, unbalance}
89/02 . Combination of a key operated switch with a manually operated switch, e.g. ignition and lighting switches
89/04 . Combination of a thermally actuated switch with a manually operated switch
89/06 . Combination of a manual reset circuit breaker with a contactor, i.e. the same circuit controlled by both a protective and a remote control device

2089/065 . . {Coordination between protection and remote control, e.g. protection job repartition, mutual assistance or monitoring}
89/08 . . with both devices using the same contact pair
89/10 . . . with each device controlling one of the two

2201/00 Contacts
2201/002 . bounceless
2201/004 . Wiping action
2201/006 . self-aligning
2201/008 . Both contacts movable
2201/01 . Protective enclosure
2201/012 . . Inert gas in contact space
2201/014 . . Conductive gas
2201/016 . Roughened contact surface, e.g. anti-adhering
2201/018 . transparent
2201/02 . Piezo element
2201/022 . Material
2201/024 . . precious
2201/026 . . non precious
2201/028 . . . Indium tin oxide [ITO]
2201/03 . . Composite
2201/032 . . Conductive polymer; Rubber
2201/034 . . . anisotropic; Zebra
2201/036 . . . Variable resistance
2201/038 . Contact lubricant

Emergency protective devices

2203/00 Form of contacts
2203/002 . Raised edge
2203/004 . Rivet
2203/006 . Staples
2203/008 . Wires
2203/0085 . . Layered switches integrated into garment, clothes or textile
2203/01 . . Woven wire screen
2203/012 . Microprotrusions
2203/014 . . Grains; Microspheres
2203/016 . universal; modular
2203/018 . binary coded
2203/02 . Interspersed fingers
2203/022 . Helical networks
2203/024 . Convex contact surface
2203/026 . on different planes
2203/028 . embedded in layer material
2203/03 . printed on casing
2203/032 . Metal foil
2203/034 . Common bus
2203/036 . to solve particular problems
2203/038 . . to be bridged by a dome shaped contact
2203/04 . . to facilitate connections
2203/042 . . to avoid cross-overs
2203/044 . . to achieve a predetermined sequence of switching
2203/046 . . to save ink
2203/048 . . to facilitate application
2203/05 . . to avoid damage by deformation of layers
2203/052 . . for backlighted keyboards
2203/054 . . for redundancy, e.g. several contact pairs in parallel
2203/056 . Cuts or depressions in support, e.g. to isolate contacts
2203/058 . Contact area function of position on layered keyboard

2205/00 Movable contacts
2205/002 . fixed to operating part
2205/004 . fixed to substrate
2205/006 . mounted on spacer
2205/008 . . Hollow rivet
2205/01 . mounted on flap cut out and bend out of layer
2205/012 . mounted on both sides of layer
2205/014 . fixed by mechanical deformation
2205/016 . Separate bridge contact
2205/018 . . Support points upwardly concave
2205/02 . . avoiding rotation
2205/022 . . Conductive rubber
2205/024 . . Means to facilitate positioning
2205/026 . . . Adhesive sheet
2205/028 . . . Protuberances on substrate
2205/03 . . . Apertured plate
2205/032 . Several contacts formed in one plate or layer
2205/034 . . with snap action
2205/036 . . Helicoidal cuts
2205/038 . . Cutting of connecting areas

2207/00 Connections
2207/002 . Conductive rubber; Zebra
2207/004 . Printed circuit tail
2207/006 . Upraised portions
2207/008 . Adhesive means; Conductive adhesive
2207/01 . from bottom to top layer
2207/012 . via underside of substrate
2207/014 . . Plated through holes
2207/016 . Jumpers; Cross-overs
2207/018 . . Spacer elements
2207/02 . Solder
2207/022 . Plug
2207/024 . . in top layer
2207/026 . Pressure contact
2207/028 . on spacer
2207/03 . via return spring
2207/032 . Surface mounted component
2207/034 . sealed
2207/036 . Crimping connector
2207/038 . Conductive paste
2207/04 . Details of printed conductors
2207/042 . . Covering maximal area of layer
2207/044 . . Resist layer
2207/046 . . Non overlapping lower and upper conductors
2207/048 . Inductive or infrared coupling

2209/00 Layers
2209/002 . Materials
2209/0021 . . with metallic appearance, e.g. polymers with dispersed particles to produce a metallic appearance
2209/004 . Depressions or protrusions on switch sites
2209/006 . Force isolators
2209/01 . Increasing rigidity; Anti-creep
2209/012 . avoiding too large deformation or stress
2209/014 . composed of different layers; Lubricant in between
2209/016 . Protection layer, e.g. for legend, anti-scratch

2209/018 . flat, smooth or ripple-free
2209/02 . UV or light sensitive
2209/022 . Velvet; Mat finish
2209/024 . Properties of the substrate
2209/026 . . metallic
2209/028 . . Paper
2209/03 . . elastomeric
2209/032 . . non elastomeric
2209/034 . . Conductive rubber
2209/036 . . with memory properties
2209/038 . . transparent
2209/04 . . . Glass
2209/042 . . Trellis; Lattice
2209/044 . . ceramic
2209/046 . Properties of the spacer
2209/048 . . metallic
2209/05 . . Paper
2209/052 . . elastomeric
2209/054 . . non elastomeric
2209/056 . . Conductive rubber
2209/058 . . with memory properties
2209/06 . . transparent
2209/062 . . . Glass
2209/064 . . Trellis; Lattice
2209/066 . . ceramic
2209/068 . Properties of the membrane
2209/07 . . metallic
2209/072 . . Paper
2209/074 . . elastomeric
2209/076 . . non elastomeric
2209/078 . . Conductive rubber
2209/08 . . with memory properties
2209/082 . . transparent
2209/084 . . . Glass
2209/086 . . Trellis; Lattice
2209/088 . . ceramic

2211/00 Spacers
2211/002 . Fluid or inflatable keyboards
2211/004 . Adhesive
2211/006 . Individual areas
2211/008 . . Spring loaded pins
2211/01 . . Ink
2211/012 . . . Successive layers, one being conductive
2211/014 . . universal
2211/016 . . Wires
2211/018 . . on printed conductors only
2211/02 . . Pins forming part of substrate
2211/022 . for larger actuation area
2211/024 . Peripheral edge deformable
2211/026 . without separate element
2211/028 . . Contacts in depressions of layers
2211/03 . . Ridges on layers
2211/032 . . Pressure sensitive layer on contacts
2211/034 . . Fixed contacts on different planes
2211/036 . . Convexly bowed membrane

2213/00 Venting
2213/002 . with external pressure
2213/004 . . Scavenger; Filter
2213/006 . . Labyrinth
2213/008 . . Flaps cut out forming valves
2213/01 . with internal pressure of other switch sites
2213/012 . . Open-cell foam
2213/014 . . Accumulator chamber
2213/016 . in adhesive layer

2215/00 Tactile feedback
2215/002 . Longer travel
2215/004 . Collapsible dome or bubble
2215/006 . . Only mechanical function
2215/008 . . Part of substrate or membrane
2215/01 . . Part of spacer
2215/012 . . Positioning of individual dome
2215/014 . . Avoiding permanent dome inversion
2215/016 . . Collapsing to second stable position
2215/018 . . unstressed in open position of switch
2215/02 . . Reversed domes
2215/022 . . Asymmetric; Elliptic; Square
2215/024 . . . Spider
2215/026 . . Eccentric actuation
2215/028 . alterable
2215/03 . Sound
2215/032 . . Resonance space
2215/034 . Separate snap action
2215/036 . . Metallic disc
2215/038 . . Resilient conductive tracks
2215/04 . . Contact making part moved through contact supporting plane
2215/042 . . Permanent magnets
2215/044 . Light
2215/046 . Inflatable bubble or cell
2215/048 . Vent
2215/05 . electromechanical
2215/052 . . piezoelectric
2215/054 . common to all switch sites

2217/00 Facilitation of operation; Human engineering
2217/002 . actuable from both sides
2217/004 . Larger or different actuating area
2217/006 . Different feeling for different switch sites
2217/008 . Pretravel to avoid inadvertent switching
2217/01 . Off centre actuation
2217/012 . Two keys simultaneous considerations
2217/014 . handicapped
2217/016 . Pressure reduction membrane; Spreader layer
2217/018 . Indication of switch sites
2217/02 . After travel
2217/022 . Part of keyboard not operable
2217/024 . Profile on actuator
2217/026 . Pencil operated
2217/028 . on planes with different or alterable inclination, e.g. convex plane
2217/03 . . Concave plane
2217/032 . Feedback about selected symbol, e.g. display
2217/033 . . by speech
2217/034 . Support for hands or arms
2217/036 . Plural multifunctional miniature keys for one symbol
2217/038 . Prompting
2217/04 . Mimics of controlled apparatus or symbol
2217/042 . Higher keytops
2217/044 . Repetitive strain injury [RSI] considerations
2217/046 . Enhanced legend space by smaller actuators

2217/048 . adapted for operation by left- and right-handed

2219/00 Legends

2219/002 . replaceable; adaptable
2219/0023 . . Images formed with electrophoretic technology, e.g. by charged pigment particles rearranged by applied electric field, e.g. electronic paper or e-paper, active ink, gyricon
2219/0026 . . having outer surface of housing of electronic apparatus programmable as display and/or input device
2219/004 . . Magnet
2219/006 . . Snap mounting
2219/008 . . Adhesive
2219/01 . . Liquid crystal
2219/011 . . . with integrated photo- or thermovoltaic cell as power supply
2219/012 . . . programmable
2219/014 . . LED
2219/016 . . . programmable
2219/018 . . Electroluminescent panel
2219/02 . . . programmable
2219/022 . . Plasma display
2219/024 . . . programmable
2219/026 . . with programming switches
2219/028 . Printed information
2219/03 . . in transparent keyboard
2219/032 . . photographic
2219/034 . . Coloured areas
2219/036 . Light emitting elements
2219/037 . . using organic materials, e.g. organic LED
2219/038 . . ambient light dependent
2219/039 . . Selective or different modes of illumination
2219/04 . . Attachments; Connections
2219/042 . . replaceable
2219/044 . . Edge lighting of layer
2219/046 . . above switch site
2219/048 . . Constituting key
2219/05 . . Key offset in relation to switch site
2219/052 . . Phosphorescence
2219/053 . . protected by inert gas
2219/054 . Optical elements
2219/056 . . Diffuser; Uneven surface
2219/058 . . Optical grid, collimator or microlouver
2219/06 . . Reflector
2219/062 . . Light conductor
2219/0621 . . . Optical fiber light conductor
2219/0622 . . . only an illuminated ring around keys
2219/064 . . Optical isolation of switch sites
2219/066 . . Lens

2221/00 Actuators

2221/002 . integral with membrane
2221/004 . . U-shaped openings surrounding keys
2221/006 . . Adhesive
2221/008 . other then push button
2221/01 . . also rotatable
2221/012 . . Joy stick type
2221/014 . . Slide selector
2221/016 . . Lever; Rocker
2221/018 . . Tumbler
2221/02 . . pneumatic
2221/022 . . electromagnetic
2221/024 . Transmission element
2221/026 . . Guiding or lubricating nylon
2221/028 . . . Telescopic guiding
2221/03 . . Stoppers for on or off position
2221/032 . adjustable
2221/034 . . Coded keys
2221/036 . Return force
2221/038 . . Fluid
2221/04 . . magnetic
2221/042 . . Foam
2221/044 . . Elastic part on actuator or casing
2221/046 . bistable
2221/048 . . magnetic
2221/05 . Force concentrator; Actuating dimple
2221/052 . interlocked
2221/054 . connected by flexible webs
2221/056 . Modular conception
2221/058 . to avoid tilting or skewing of contact area or actuator
2221/06 . to avoid sticking in on position
2221/062 . Damping vibrations
2221/064 . Limitation of actuating pressure
2221/066 . replaceable
2221/068 . having a not operable condition
2221/07 . transparent
2221/0702 . . Transparent key containing three dimensional (3D) element
2221/072 . Stroke amplification
2221/074 . One molded piece
2221/076 . Protruding in cavity covered by membrane
2221/078 . Different operating parts on a bigger one
2221/08 . composed of different parts
2221/082 . . Superimposed actuators
2221/084 . made at least partly of elastic foam
2221/088 . actuable from different directions
2221/09 . Flexible integral part of housing

2223/00 Casings

2223/002 . sealed
2223/003 . . Membrane embracing all keys
2223/004 . . Evacuation of penetrating liquid
2223/006 . . Purge gas
2223/008 . metallic
2223/01 . Mounting on appliance
2223/012 . . Snap mounting
2223/014 . . located in recess
2223/016 . . magnetic
2223/018 . . rotatably
2223/02 . . mounted on raised part
2223/022 . . Adhesive
2223/024 . . Screw
2223/026 . . Hook and loop
2223/028 . . detachable
2223/03 . Separate key housing
2223/032 . . with formations for assembling similar housings
2223/034 . Bezel
2223/0345 . . with keys positioned directly next to each other without an intermediate bezel or frame
2223/036 . . forming chamfered apertures for keys
2223/038 . transparent
2223/04 . portable; hand held
2223/042 . mounted in conventional keyboard

2223/044 . Protecting cover
2223/046 . convertible
2223/048 . . assembled by removable part
2223/05 . . composed of hingedly connected sections
2223/052 . . reductible in size, e.g. for transportation
2223/054 . Mounting of key housings on same printed circuit
2223/056 . Mounting of key housings on same frame
2223/058 . flush mounted
2223/06 . freestanding
2223/062 . Inflatable

2225/00 Switch site location
2225/002 . superimposed
2225/004 . in different planes to increase density
2225/006 . more then one pole
2225/008 . Two different sites for one circuit, e.g. for safety
2225/01 . Different switch sites under one actuator in same plane
2225/012 . normally closed
2225/014 . normally closed combined with normally open
2225/016 . Make break
2225/018 . Consecutive operations
2225/02 . Push-push
2225/022 . other then row-column disposition
2225/024 . Common site to all actuators, e.g. auxiliary
2225/026 . above actuator
2225/028 . perpendicular to base of keyboard
2225/03 . Different type of switches

2227/00 Dimensions; Characteristics
2227/002 . Layer thickness
2227/004 . . Membrane
2227/006 . . Spacer
2227/008 . . Substrate
2227/01 . . Adhesive
2227/012 . . Conductive rubber
2227/014 . . . Conductive particles
2227/016 . Switch site protrusions; Force concentrators
2227/018 . Printed contacts; Metal foil
2227/02 . Vent opening
2227/022 . Collapsable dome
2227/024 . Spacer elements
2227/026 . Separate dome contact
2227/0261 . . with an aperture in contact making centre of dome
2227/028 . Key stroke
2227/03 . Hardness
2227/032 . Operating force
2227/034 . . Regulation of operating force
2227/036 . Minimise height

2229/00 Manufacturing
2229/002 . Screen printing
2229/004 . . Conductive ink
2229/006 . Pad transfer printing
2229/008 . Die stamping
2229/01 . Foil transfer process
2229/012 . Vacuum deposition
2229/014 . Electro deposition
2229/016 . Selective etching
2229/018 . Testing
2229/02 . Laser
2229/022 . Modular assembly
2229/024 . Packing between substrate and membrane
2229/026 . . Riveting
2229/028 . . Adhesive
2229/03 . . Laminating
2229/032 . . Screw
2229/034 . Positioning of layers
2229/036 . ultrasonic
2229/038 . Folding of flexible printed circuit
2229/04 . Solder problems
2229/042 . Snap coupling; Snap mounting
2229/044 . Injection moulding
2229/046 . . Multi-colour or double shot injection moulding
2229/047 . . Preformed layer in mould
2229/048 . . Insertion moulding
2229/05 . Forming; Half-punching
2229/052 . Thermoplastic bonding foil
2229/054 . CAD
2229/056 . Laminating
2229/058 . Curing or vulcanising of rubbers
2229/06 . Tempering
2229/062 . Maintenance or repair facilities
2229/064 . Eliminating tolerances
2229/066 . Z-axis assembly
2229/068 . Extrusion

2231/00 Applications
2231/002 . Calculator, computer
2231/004 . CRT
2231/006 . Bank automat; Cash register; Vending machine
2231/008 . Video game
2231/01 . Toy
2231/012 . Household appliance
2231/014 . Sewing machine
2231/016 . Control panel; Graphic display; Programme control
2231/018 . Musical instrument
2231/022 . Telephone handset
2231/024 . Dispensing machine
2231/026 . Car
2231/028 . Watch
2231/03 . Elevator
2231/032 . Remote control
2231/034 . Coordinate determination
2231/036 . Radio; TV
2231/038 . Level sensing or limit switch
2231/04 . Robot
2231/042 . Briefcase; Note-book
2231/044 . Under water
2231/046 . Camera
2231/048 . Tools; Drilling machines
2231/05 . Card, e.g. credit card
2231/052 . Selectors, e.g. dimmers

2233/00 Key modules
2233/002 . joined to form button rows
2233/004 . . One molded part
2233/006 . . . Separating individual keys after mounting
2233/008 . Laykey mounted on assembled key modules
2233/01 . mounted on laykey
2233/012 . . Locating pins
2233/014 . . Snap coupling
2233/016 . . . with limited freedom
2233/018 . . One degree of freedom

2233/02 . . captured between assembled parts of support
2233/022 . . . with limited freedom
2233/024 . . Riveting
2233/026 . . Inserting
2233/028 . . connected by spring
2233/03 . mounted on support plate or frame
2233/032 . . Locating pins
2233/034 . . Snap coupling
2233/036 . . . with limited freedom
2233/038 . . One degree of freedom
2233/04 . . captured between assembled parts of support
2233/042 . . . with limited freedom
2233/044 . . Riveting
2233/046 . . Inserting
2233/048 . . connected by spring
2233/05 . Actuator part on body
2233/052 . . Locating pins
2233/054 . . Snap coupling
2233/056 . . . with limited freedom
2233/058 . . One degree of freedom
2233/06 . . captured between assembled parts of support
2233/062 . . . with limited freedom
2233/064 . . Riveting
2233/066 . . Inserting
2233/068 . . connected by spring
2233/07 . Cap or button on actuator part
2233/072 . . Locating pins
2233/074 . . Snap coupling
2233/076 . . . with limited freedom
2233/078 . . One degree of freedom
2233/08 . . captured between assembled parts of support
2233/082 . . . with limited freedom
2233/084 . . Riveting
2233/086 . . Inserting
2233/088 . . connected by spring
2233/09 . Actuating striker on actuator part
2233/092 . . Locating pins
2233/094 . . Snap coupling
2233/096 . . . with limited freedom
2233/098 . . One degree of freedom
2233/10 . . captured between assembled parts of support
2233/102 . . . with limited freedom
2233/104 . . Riveting
2233/106 . . Inserting
2233/108 . . connected by spring

2235/00 Springs

2235/002 . Linear coil spring combined with dome spring
2235/004 . Two parallel coil springs
2235/006 . Elastic arms producing non linear counter force
2235/008 . Rubber spring
2235/01 . Spiral spring
2235/012 . Euler spring
2235/014 . . with positive buckling force or action
2235/016 . Preloading
2235/018 . Spring seat
2235/02 . between contact and substrate
2235/022 . Actuating striker
2235/024 . . formed by knee or dimple of leaf spring
2235/026 . . forming part of return spring
2235/028 . Blade spring
2235/03 . Two serial springs

2237/00 Mechanism between key and laykey

2237/002 . Bell crank
2237/004 . Cantilever
2237/006 . Guided plunger or ball
2237/008 . Plunger guided by flexible arms

2239/00 Miscellaneous

2239/002 . Conductive track to monitor integrity
2239/004 . High frequency adaptation or shielding
2239/006 . Containing a capacitive switch or usable as such
2239/008 . Static electricity considerations
2239/01 . combined with other elements on the same substrate
2239/012 . . Decoding impedances
2239/014 . . on both sides
2239/016 . combined with start switch, discrete keyboard
2239/018 . Ground conductor
2239/02 . Other elements in moving part
2239/022 . with opto-electronic switch
2239/024 . with inductive switch
2239/026 . Internal encoding, e.g. validity bit
2239/03 . Avoiding erroneous switching
2239/032 . Anti-tamper
2239/034 . Environmental protection
2239/036 . . Heating, e.g. against condensation
2239/038 . Anti-vandalism
2239/04 . Gadget
2239/042 . Unmixable liquids inside
2239/044 . High voltage application
2239/046 . Getter
2239/048 . comprising microphone or speaker
2239/05 . Mode selector switch, e.g. shift, or indicator
2239/052 . Strain gauge
2239/054 . Acoustic pick-up, e.g. ultrasonic
2239/056 . Keyboard or overlay identification features
2239/058 . Containing a battery
2239/06 . Temperature sensitive
2239/062 . Disposable
2239/064 . Simulating the appearance of touch panel
2239/066 . Duplication of control panel, e.g. duplication of some keys
2239/068 . 3D
2239/07 . UV or IR detection, e.g. of human body
2239/072 . High temperature considerations
2239/074 . Actuation by finger touch
2239/076 . Key stroke generating power
2239/078 . Variable resistance by variable contact area or point

2300/00 Orthogonal indexing scheme relating to electric switches, relays, selectors or emergency protective devices covered by H01H

2300/002 . Application electric motor braking, e.g. pole reversal of rotor, shorting motor coils, also for field discharge
2300/004 . Application hearing aid
2300/006 . Application power roofs
2300/008 . Application power seats
2300/01 . Application power window
2300/012 . Application rear view mirror
2300/014 . Application surgical instrument
2300/016 . Application timepiece

2300/018 . Application transfer; between utility and emergency power supply (circuits in H02J 9/04)
2300/02 . Application transmission, e.g. for sensing the position of a gear selector or automatic transmission
2300/022 . Application wake up; switches or contacts specially provided for the wake up or standby shift of a circuit
2300/024 . Avoid unwanted operation
2300/026 . Application dead man switch: power must be interrupted on release of operating member
2300/028 . Application dead man switch, i.e. power being interrupted by panic reaction of operator, e.g. further pressing down push button
2300/03 . Application domotique, e.g. for house automation, bus connected switches, sensors, loads or intelligent wiring
2300/032 . . using RFID technology in switching devices
2300/034 . using magnetic shape memory [MSM] also an austenite-martensite transformation, but then magnetically controlled
2300/036 . Application nanoparticles, e.g. nanotubes, integrated in switch components, e.g. contacts, the switch itself being clearly of a different scale, e.g. greater than nanoscale
2300/038 . Preselection, i.e. the output of a switch depends on a particular preselection, e.g. a particular position of another switch
2300/04 . Programmable interface between a set of switches and a set of functions, e.g. for reconfiguration of a control panel
2300/042 . Application rejection, i.e. preventing improper installation of parts
2300/044 . Application rejection 1: coded interacting surfaces, polarising, e.g. to avoid insertion of a circuit breaker or fuse or relay or rating plug of the wrong caliber or in the wrong direction
2300/046 . using snap closing mechanisms
2300/048 . . Snap closing by latched movable contact, wherein the movable contact is held in a minimal distance from the fixed contact during first phase of closing sequence in which a closing spring is charged
2300/05 . . Snap closing with trip, wherein the contacts are locked open during charging of mechanism and unlocked by separate trip device, e.g. manual, electromagnetic etc.
2300/052 . Controlling, signalling or testing correct functioning of a switch (see also H01H 2300/056 - H01H 2300/066 and H01H 11/0062)
2300/054 . Application timeslot: duration of actuation or delay between or combination of subsequent actuations determines selected function
2300/056 . Tools for actuating a switch
2300/058 . . using apparatus with a spring motor or a snap-acting mechanism for actuating any one of a number of circuit breakers
2300/06 . using tools as locking means
2300/062 . . for locking a charged spring
2300/064 . . . by means of removable member
2300/066 . . for locking a switch in a test or an "installation" position