

# CPC COOPERATIVE PATENT CLASSIFICATION

## H ELECTRICITY

(NOTE omitted)

## H01 ELECTRIC ELEMENTS

(NOTES omitted)

### H01H ELECTRIC SWITCHES; RELAYS; SELECTORS; EMERGENCY PROTECTIVE DEVICES (contact cables [H01B 7/10](#); electrolytic self-interrupters [H01G 9/18](#); emergency protective circuit arrangements [H02H](#); switching by electronic means without contact-making [H03K 17/00](#))

#### NOTES

1. 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.
2. 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](#).
3. 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".
4. 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:
 

|                             |            |                             |
|-----------------------------|------------|-----------------------------|
| <a href="#">H01H 13/708</a> | covered by | <a href="#">H01H 13/702</a> |
| <a href="#">H01H 33/575</a> | covered by | <a href="#">H01H 33/56</a>  |
| <a href="#">H01H 33/825</a> | covered by | <a href="#">H01H 33/82</a>  |
| <a href="#">H01H 33/835</a> | covered by | <a href="#">H01H 33/83</a>  |
| <a href="#">H01H 33/867</a> | covered by | <a href="#">H01H 33/86</a>  |
| <a href="#">H01H 33/873</a> | covered by | <a href="#">H01H 33/86</a>  |
| <a href="#">H01H 33/915</a> | covered by | <a href="#">H01H 33/91</a>  |
| <a href="#">H01H 33/985</a> | covered by | <a href="#">H01H 33/98</a>  |
| <a href="#">H01H 33/99</a>  | covered by | <a href="#">H01H 33/98</a>  |

## H01H

- (continued) 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**

|             |  |            |  |
|-------------|--|------------|--|
| <b>1/00</b> | <b>Contacts</b> (liquid contacts <a href="#">H01H 29/04</a> )  |            |  |
| 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 <a href="#">G01R 31/3274</a> )}   |            |  |
| 2001/0021   | . . {Camera or endoscope for monitoring contacts, their position or mechanism}   | 1/023      | . . . having a noble metal as the basic material   |
| 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}  | 1/0231     | . . . . {provided with a solder layer}   |
| 2001/0031   | . . {by analysing radiation emitted by arc or trace material}  | 1/0233     | . . . . and containing carbides  |
| 1/0036      | . {Switches making use of microelectromechanical systems [MEMS] (for electromagnetic relays <a href="#">H01H 50/005</a> ; for electrostatic relays <a href="#">H01H 59/0009</a> )} | 1/0237     | . . . . and containing oxides  |
| 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}               | 1/02372    | . . . . . {containing as major components one or more oxides of the following elements only: Cd, Sn, Zn, In, Bi, Sb or Te}                     |
| 2001/0047   | . . . {operable only by mechanical latching}   | 1/02374    | . . . . . {containing as major component CdO}  |
| 2001/0052   | . . {Special contact materials used for MEMS}  | 1/02376    | . . . . . {containing as major component SnO <sub>2</sub> }  |
| 2001/0057   | . . . {the contact materials containing refractory materials, e.g. tungsten}   | 2001/02378 | . . . . . {containing iron-oxide as major component}   |
| 2001/0063   | . . {having electrostatic latches, i.e. the activated position is kept by electrostatic forces other than the activation force}  | 1/025      | . . . having copper as the basic material  |
| 2001/0068   | . . {with multi dimensional movement, i.e. the movable actuator performing movements in at least two different directions}   | 1/027      | . . . containing carbon particles or fibres  |
| 2001/0073   | . . {Solutions for avoiding the use of expensive silicon technologies in micromechanical switches}   | 1/029      | . . . comprising conducting material dispersed in an elastic support or binding material   |
| 2001/0078   | . . {with parallel movement of the movable contact relative to the substrate}  | 1/04       | . . Co-operating contacts of different material  |
| 2001/0084   | . . {with perpendicular movement of the movable contact relative to the substrate}   | 1/06       | . characterised by the shape or structure of the contact-making surface, e.g. grooved  |
| 2001/0089   | . . {Providing protection of elements to be released by etching of sacrificial element; Avoiding stiction problems, e.g. of movable element to substrate}                          | 1/065      | . . {formed by freely suspended particles, e.g. magnetic dust or balls}  |
| 1/0094      | . {Switches making use of nanoelectromechanical systems [NEMS]}  | 1/08       | . . wetted with mercury  |
| 1/02        | . characterised by the material thereof {(containing gas-evolving material <a href="#">H01H 33/765</a> )}  | 1/10       | . . Laminated contacts with divided contact surface  |
| 1/0201      | . . {Materials for reed contacts}  | 1/12       | . characterised by the manner in which co-operating contacts engage  |
| 1/0203      | . . {specially adapted for vacuum switches}  | 2001/125   | . . {whereby the contacts of the switch are formed by teeth of a zipper}   |
| 2001/0205   | . . . {Conditioning of the contact material through arcing during manufacturing, e.g. vacuum-depositing of layer on contact surface}   | 1/14       | . . by abutting  |
| 1/0206      | . . . {containing as major components Cu and Cr}   | 2001/145   | . . . {by crossing each other, the cooperating contacts each having a contact making ridge perpendicular to each other}                        |
| 2001/0208   | . . {containing rhenium}   | 1/16       | . . . by rolling; by wrapping; Roller or ball contacts   |
| 1/021       | . . Composite material   | 1/18       | . . . with subsequent sliding  |
|             |  | 1/20       | . . . Bridging contacts {(for circuit breakers <a href="#">H01H 73/045</a> )}  |
|             |  | 1/2008     | . . . . {Facilitate mounting or replacing contact bridge and pressure spring on carrier ( <a href="#">H01H 11/0012</a> 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}                       |

**NOTES**

1. In this group, the following expression is used with the meaning indicated :

|           |           |  |           |       |   |
|-----------|-----------|--|-----------|-------|---|
| 1/2066    | . . . .   | {Fork-shaped bridge; Two transversally connected contact arms bridging two fixed contacts}   | 1/502     | . .   | {the action of the contact pressure spring becoming active only after engagement of the contacts}   |
| 1/2075    | . . . .   | {T-shaped bridge; bridging contact has lateral arm for mounting resiliently or on a pivot}   | 1/504     | . .   | {by thermal means}  |
| 1/2083    | . . . .   | {Bridging contact surfaces directed at an oblique angle with respect to the movement of the bridge}  | 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}   |
| 2001/2091 | . . . .   | {having two pivotally and electrically connected halve bridges}  | 2001/508  | . .   | {with mechanical means to prevent return/reverse movement of movable contact once opening or closing cycle has started}   |
| 1/22      | . . .     | with rigid pivoted member carrying the moving contact  | 1/52      | . .   | Contacts adapted to act as latches  |
| 1/221     | . . . .   | {and a contact pressure spring acting between the pivoted member and a supporting member}  | 1/54      | . .   | by magnetic force {(combined with electrodynamic opening <a href="#">H01H 77/101</a> )}   |
| 2001/223  | . . . . . | {using a torsion spring}   | 2001/545  | . . . | {having permanent magnets directly associated with the contacts}  |
| 1/225     | . . . . . | {the supporting member being pivotable}  | 1/56      | . .   | Contact arrangements for providing make-before-break operation, e.g. for on-load tap-changing   |
| 1/226     | . . . . . | {having a plurality of parallel contact bars}  | 1/58      | . .   | Electric connections to or between contacts; Terminals {(for high tension switches <a href="#">H01H 33/025</a> ; for electromagnetic relays <a href="#">H01H 50/14</a> ; for circuit breakers <a href="#">H01H 71/08</a> )} |
| 2001/228  | . . . . . | {with insulating spacers between the contact bars}   | 1/5805    | . .   | {Connections to printed circuits (for slide switches <a href="#">H01H 15/005</a> ; for tumbler switches <a href="#">H01H 23/006</a> )}  |
| 1/24      | . . .     | with resilient mounting  | 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}  |
| 1/242     | . . . .   | {the contact forming a part of a coil spring}  | 2001/5816 | . . . | {Connections to flexible or curved printed circuit boards}  |
| 1/245     | . . . .   | {Spring wire contacts}   | 1/5822    | . .   | {Flexible connections between movable contact and terminal}   |
| 2001/247  | . . . .   | {using an elastic hinge, the contact being composed of rigid parts connected by thinned flexible hinge parts}  | 2001/5827 | . . . | {Laminated connections, i.e. the flexible conductor is composed of a plurality of thin flexible conducting layers}  |
| 1/26      | . . . .   | with spring blade support  | 1/5833    | . .   | {comprising an articulating, sliding or rolling contact between movable contact and terminal}   |
| 2001/265  | . . . . . | {having special features for supporting, locating or pre-stressing the contact blade springs}  | 2001/5838 | . . . | {using electrodynamic forces for enhancing the contact pressure between the sliding surfaces}   |
| 1/28      | . . . . . | Assembly of three or more contact-supporting spring blades   | 1/5844    | . .   | {making use of wire-gripping clips or springs}  |
| 1/30      | . . . .   | within supporting guides   | 1/585     | . . . | {and piercing the wire insulation}  |
| 1/32      | . . .     | Self-aligning contacts   | 1/5855    | . .   | {characterised by the use of a wire clamping screw or nut}  |
| 1/34      | . . .     | with provision for adjusting position of contact relative to its co-operating contact  | 2001/5861 | . . . | {Box connector with a collar or lug for clamping internal rail and external conductor together by a tightening screw}   |
| 1/36      | . .       | by sliding   | 1/5866    | . .   | {characterised by the use of a plug and socket connector}   |
| 1/365     | . . .     | {Bridging contacts}  | 2001/5872 | . . . | {including means for preventing incorrect coupling}   |
| 1/38      | . . .     | Plug-and-socket contacts   | 2001/5877 | . .   | {with provisions for direct mounting on a battery pole}   |
| 1/385     | . . . .   | {Contact arrangements for high voltage gas blast circuit breakers}   | 2001/5883 | . .   | {the extension of the contact being crimped around a wire}  |
| 1/40      | . . .     | Contact mounted so that its contact-making surface is flush with adjoining insulation  | 2001/5888 | . .   | {Terminals of surface mounted devices [SMD]}  |
| 1/403     | . . . .   | {Contacts forming part of a printed circuit (multilayer keyboard switches <a href="#">H01H 13/702</a> ; thumbwheel switches <a href="#">H01H 19/001</a> ; for rotary switches with axial contact pressure <a href="#">H01H 19/585</a> )} | 2001/5894 | . .   | {the extension of the contact being welded to a wire or a bus}  |
| 2001/406  | . . . .   | {with holes or recesses between adjacent contacts, e.g. to collect abrasion powder}  | 1/60      | . .   | Auxiliary means structurally associated with the switch for cleaning or lubricating contact-making surfaces (cleaning by normal sliding of contacts <a href="#">H01H 1/18</a> , <a href="#">H01H 1/36</a> )                 |
| 1/42      | . . .     | Knife-and-clip contacts  | 1/605     | . .   | {Cleaning of contact-making surfaces by relatively high voltage pulses}   |
| 2001/425  | . . . .   | {with separate contact pressure spring confined between two contact knives and urging the knives onto a mating contact}  | 1/62      | . .   | Heating or cooling of contacts  |
| 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  |           |       |   |

|             |  |          |   |
|-------------|--|----------|---|
| 1/64        | • Protective enclosures, baffle plates, or screens for contacts  | 3/12     | • • Push-buttons  |
| 1/645       | • • {containing getter material (for explosion inhibiting in explosion-proofcases <a href="#">H01H 9/046</a> ; for vacuum switches <a href="#">H01H 33/6683</a> )} | 3/122    | • • • {with enlarged actuating area, e.g. of the elongated bar-type; Stabilising means therefor}  |
| 1/66        | • • Contacts sealed in an evacuated or gas-filled envelope, e.g. magnetic dry-reed contacts  | 3/125    | • • • • {using a scissor mechanism as stabiliser}   |
| <b>3/00</b> | <b>Mechanisms for operating contacts ({for tap changers <a href="#">H01H 9/0027</a>;} thermal actuating or release means <a href="#">H01H 37/02</a>)</b>           | 2003/127 | • • • {Details of the key cap concerning the actuation by fingernails or having provision to allow usage with long fingernails}   |
| 3/001       | • {Means for preventing or breaking contact-welding}   | 3/14     | • • adapted for operation by a part of the human body other than the hand, e.g. by foot   |
| 2003/002    | • • {with lockout, e.g. two contact pairs in series}   | 3/141    | • • • {Cushion or mat switches}   |
| 3/004       | • {for operating contacts periodically}  | 3/142    | • • • • {of the elongated strip type}   |
| 3/005       | • {making use of superconductivity, e.g. levitation switch}  | 2003/143 | • • • • • {provisions for avoiding the contact actuation when the elongated strip is bended}  |
| 2003/007    | • {the contacts being actuated by deformation of a flexible housing}   | 2003/145 | • • • • • {provisions for avoiding closure or contact damage during manufacturing or mounting}  |
| 2003/008    | • {with a haptic or a tactile feedback controlled by electrical means, e.g. a motor or magnetofriction}  | 2003/146 | • • • • • {being normally closed}   |
| 3/02        | • Operating parts, i.e. for operating driving mechanism by a mechanical force external to the switch   | 2003/147 | • • • • • {Special aspects regarding the peripheral edges of the mat switches}  |
| 3/0206      | • • {Combined operation of electric switch and of fluid control device}  | 2003/148 | • • • • • {the mat switch being composed by independently juxtaposed contact tiles, e.g. for obtaining a variable protected area}   |
| 3/0213      | • • {Combined operation of electric switch and variable impedance, e.g. resistor, capacitor ( <a href="#">H01H 9/061</a> takes precedence)}                        | 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   |
| 3/022       | • • {Emergency operating parts, e.g. for stop-switch in dangerous conditions}  | 3/161    | • • • {for actuation by moving a closing member, e.g. door, cover or lid ( <a href="#">the switch controlling enclosed equipment <a href="#">H01H 9/226</a>; switches operated by a removable member, wherein one single insertion movement of a key comprises an unlocking stroke and a switch actuating stroke, e.g. security switch for safety guards <a href="#">H01H 27/002</a></a> )} |
| 3/0226      | • • • {operated by a pull cord}  | 3/162    | • • • • {associated with a hinge of the closing member}   |
| 2003/0233   | • • • {for alarm triggering, e.g. fire alarm, emergency off switches operated by breaking a glass}   | 3/163    | • • • • {associated with locking or manipulating means of the closing member}   |
| 2003/024    | • • • {Resetting of bistable emergency operating part by pulling it}   | 2003/165 | • • • • • {associated with an edge of the closing member}   |
| 2003/0246   | • • • {Resetting of bistable emergency operating part by rotating itself or an accessory}  | 3/166    | • • • • {Self-adjusting mountings, transmissions and the like}  |
| 3/0253      | • • {two co-operating contacts actuated independently (for combined circuit-breaker-contactors <a href="#">H01H 89/10</a> )}                                       | 2003/167 | • • • • • {with locking of the adjusted parts in the adjusted position by a separate action}  |
| 2003/026    | • • {specially adapted to avoid injury to occupants of a car during an accident}   | 3/168    | • • • • {operated by movement in any direction}   |
| 2003/0266   | • • {Operating part bringable in an inoperative position by an electrical drive}   | 3/18     | • • • the movement in one direction being intentionally by hand, e.g. for setting automatically cancelled trafficators  |
| 2003/0273   | • • {Manually irreversibly actuated switch}  | 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   |
| 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}              | 3/22     | • Power arrangements internal to the switch for operating the driving mechanism   |
| 2003/0286   | • • {having a weak point breaking or uncoupling on abnormal external force}  | 3/222    | • • {using electrodynamic repulsion}  |
| 2003/0293   | • • {with an integrated touch switch}  | 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}  |
| 3/04        | • • Levers ( <a href="#">tumblers <a href="#">H01H 23/14</a></a> )   | 3/227    | • • {Interlocked hand- and power-operating mechanisms}  |
| 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}       |          |   |



|           |  |          |  |
|-----------|--|----------|--|
| 3/24      | . . using pneumatic or hydraulic actuator { (for storing energy in a spring motor <a href="#">H01H 3/301</a> ) }   | 2003/466 | . . . {using a living hinge to connect the levers}   |
| 3/26      | . . using dynamo-electric motor (for storing energy in a spring motor <a href="#">H01H 3/30</a> )  | 3/48     | . . using lost-motion device   |
| 3/262     | . . . {using a centrifugal mechanism}  | 3/50     | . . with indexing or locating means, e.g. indexing by ball and spring  |
| 3/264     | . . . {using a travelling nut mechanism}   | 3/503    | . . . {making use of electromagnets}   |
| 2003/266  | . . . {having control circuits for motor operating switches, e.g. controlling the opening or closing speed of the contacts}  | 2003/506 | . . . {making use of permanent magnets}  |
| 2003/268  | . . . {using a linear motor}   | 3/52     | . . with means to ensure stopping at intermediate operative positions  |
| 3/28      | . . using electromagnet (for storing energy in a spring motor <a href="#">H01H 3/30</a> ; for operating relays <a href="#">H01H 45/00</a> )  | 3/54     | . Mechanisms for coupling or uncoupling operating parts, driving mechanisms, or contacts   |
| 3/30      | . . using spring motor   | 3/56     | . . using electromagnetic clutch   |
| 3/3005    | . . . {Charging means}   | 3/58     | . . using friction, toothed, or other mechanical clutch  |
| 3/301     | . . . . {using a fluid actuator}   | 3/60     | . Mechanical arrangements for preventing or damping vibration or shock   |
| 3/3015    | . . . . {using cam devices}  | 3/605    | . . {making use of a fluid damper}   |
| 3/3021    | . . . . {using unidirectional coupling}  | 3/62     | . Lubricating means structurally associated with the switch (for lubricating contact-making surfaces <a href="#">H01H 1/60</a> )   |
| 3/3026    | . . . . {in which the closing spring charges the opening spring or vice versa}   | 5/00     | <b>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</b>                                      |
| 3/3031    | . . . {Means for locking the spring in a charged state}  | 5/02     | . Energy stored by the attraction or repulsion of magnetic parts   |
| 2003/3036 | . . . . {using of balls or rollers in the locking device}  | 5/04     | . Energy stored by deformation of elastic members (by deformation of bimetallic element in thermally-actuated switches <a href="#">H01H 37/54</a> )  |
| 3/3042    | . . . {using a torsion spring}   | 5/045    | . . {making use of cooperating spring loaded wedging or camming parts between operating member and contact structure}  |
| 3/3047    | . . . {adapted for operation of a three-position switch, e.g. on-off-earth}  | 5/06     | . . by compression or extension of coil springs  |
| 3/3052    | . . . {Linear spring motors}   | 5/08     | . . . one end of spring transmitting movement to the contact member when the other end is moved by the operating part  |
| 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}   | 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 |
| 2003/3063 | . . . {Decoupling charging handle or motor at end of charging cycle or during charged condition}   | 5/12     | . . . having two or more snap-action motions in succession   |
| 2003/3068 | . . . {Housing support frame for energy accumulator and cooperating mechanism}   | 5/14     | . . by twisting of torsion members   |
| 2003/3073 | . . . {Indication of the charge on the spring motor}   | 5/16     | . . . with auxiliary means for temporarily holding parts until torsion member is sufficiently strained   |
| 2003/3078 | . . . {using an inertia element, e.g. a flywheel, to control the energy released by the spring}  | 5/18     | . . by flexing of blade springs  |
| 2003/3084 | . . . {Kinetic energy of moving parts recuperated by transformation into potential energy in closing or opening spring to be used in next operation}   | 5/20     | . . . single blade moved across dead-centre position   |
| 2003/3089 | . . . {Devices for manual releasing of locked charged spring motor; Devices for remote releasing}  | 5/22     | . . . blade spring with at least one snap-acting leg and at least one separate contact-carrying or contact-actuating leg   |
| 2003/3094 | . . . {allowing an opening - closing - opening [OCO] sequence}   | 5/24     | . . . . having three legs  |
| 3/32      | . Driving mechanisms, i.e. for transmitting driving force to the contacts (snap-action arrangements <a href="#">H01H 5/00</a> ; introducing a predetermined time delay <a href="#">H01H 7/00</a> ) | 5/26     | . . . having two or more snap-action motions in succession   |
| 2003/323  | . . {the mechanisms being adjustable}  | 5/28     | . . . two separate blade springs forming a toggle  |
| 2003/326  | . . {using bearings}   | 5/30     | . . by buckling of disc springs  |
| 3/34      | . . using ratchet  | 7/00     | <b>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 <a href="#">H01H 43/00</a>)</b>                    |
| 3/36      | . . using belt, chain, or cord   | 7/02     | . with fluid timing means  |
| 3/38      | . . using spring or other flexible shaft coupling  | 7/03     | . . with dash-pots   |
| 3/40      | . . using friction, toothed, or screw-and-nut gearing  | 7/04     | . . with flies, i.e. fan governors   |
| 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}  |          |  |

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| 7/06        | • with thermal timing means  | 2009/0285 | • • {Casings overmoulded over assembled switch or relay}  |
| 7/08        | • with timing by mechanical speed-control devices  | 2009/0292 | • • {Transparent window or opening, e.g. for allowing visual inspection of contact position or contact condition}                                       |
| 7/10        | • • by escapement  | 9/04      | • • Dustproof, splashproof, drip-proof, waterproof, or flameproof casings   |
| 7/12        | • • • mechanical   | 9/041     | • • • {Casings hermetically closed by a diaphragm through which passes an actuating member (vacuum switches <a href="#">H01H 33/66</a> )}               |
| 7/14        | • • • electromagnetic  | 9/042     | • • • {Explosion-proof cases}   |
| 7/16        | • Devices for ensuring operation of the switch at a predetermined point in the AC cycle ( <a href="#">circuit arrangements H01H 9/56</a> ) | 9/043     | • • • • {with pressure-relief devices}  |
| <b>9/00</b> | <b>Details of switching devices, not covered by groups <a href="#">H01H 1/00</a> - <a href="#">H01H 7/00</a></b>                           | 9/045     | • • • • {with interlocking mechanism between cover and operating mechanism}   |
| 9/0005      | • {Tap change devices}   | 9/046     | • • • • {with internal explosion inhibiting means}  |
| 9/0011      | • • {Voltage selector switches}  | 9/047     | • • • {provided with venting means}   |
| 9/0016      | • • {Contact arrangements for tap changers}  | 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} |
| 2009/0022   | • • • {Mounting of the fixed contacts or taps on cylindrical wall of oil vessel containing the tap changer; Details of screening}          | 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           |
| 9/0027      | • • {Operating mechanisms}   | 9/061     | • • • {enclosing a continuously variable impedance}   |
| 9/0033      | • • • {with means for indicating the selected tap or limiting the number of selectable taps}   | 9/063     | • • • {enclosing a reversing switch}  |
| 9/0038      | • • {making use of vacuum switches}  | 2009/065  | • • • {Battery operated hand tools in which the battery and the switch are directly connected}  |
| 9/0044      | • • {Casings; Mountings; Disposition in transformer housing}   | 2009/066  | • • • {having switches mounted on a control handle, e.g. gear shift lever}  |
| 2009/005    | • • • {Details concerning the sealing of the oil filled casings}   | 2009/068  | • • • {with switches mounted on a handlebar, e.g. for motorcycles, fork lift trucks, etc.}  |
| 2009/0055   | • • {Oil filters for tap change devices}   | 9/08      | • Arrangements to facilitate replacement of a switch, e.g. cartridge housing  |
| 2009/0061   | • • {Monitoring tap change switching devices}  | 9/085     | • • {contact separation effected by removing contact carrying element}  |
| 9/0066      | • {Auxiliary contact devices ( <a href="#">for arc transfer H01H 9/38</a> ; <a href="#">for electromagnetic relays H01H 50/541</a> )}      | 9/10      | • Adaptation for built-in fuses ( <a href="#">mounting switch and fuse separately on, or in, common support H02B 1/18</a> )                             |
| 9/0072      | • {particular to three-phase switches ( <a href="#">synchronous switching H01H 9/563</a> )}  | 9/102     | • • {Fuses mounted on or constituting the movable contact parts of the switch}  |
| 2009/0077   | • {using recyclable materials, e.g. for easier recycling or minimising the packing material}   | 9/104     | • • {with interlocking mechanism between switch and fuse}   |
| 2009/0083   | • {using redundant components, e.g. two pressure tubes for pressure switch}  | 9/106     | • • {fuse and switch being connected in parallel}   |
| 2009/0088   | • {Details of rotatable shafts common to more than one pole or switch unit}  | 2009/108  | • • {Building a sliding and/or a removable bridging connector for batteries}  |
| 2009/0094   | • {Details of rotatable shafts which are subdivided; details of the coupling means thereof}  | 9/12      | • Means for earthing parts of switch not normally conductively connected to the contacts  |
| 9/02        | • Bases, casings, or covers ( <a href="#">accommodating more than one switch or a switch and another electrical component H02B 1/26</a> )  | 9/14      | • Adaptation for built-in safety spark gaps   |
| 9/0207      | • • {Adjustable mounting of casings}   | 9/16      | • Indicators for switching condition, e.g. "on" or "off"  |
| 9/0214      | • • {Hand-held casings}  | 9/161     | • • {comprising light emitting elements}  |
| 2009/0221   | • • • {the switches being fixed to the operator's hand, e.g. integrated in a glove or fixed to a ring}                                     | 9/162     | • • • {Means to facilitate removal or replacement of light-emitting elements}   |
| 9/0228      | • • • {Line cord switches}   | 2009/164  | • • • {the light emitting elements being incorporated in and movable with the operating part}   |
| 9/0235      | • • • {specially adapted for remote control, e.g. of audio or video apparatus}   | 9/165     | • • {comprising numbered dials ( <a href="#">thumb-wheel switches H01H 19/001</a> )}  |
| 9/0242      | • • • • {Protective enclosures; Cushioning means}  | 9/167     | • • {Circuits for remote indication}  |
| 9/025       | • • • • {Stands or organisers to facilitate location or operation}   | 9/168     | • • {making use of an electromagnetic wave communication}   |
| 2009/0257   | • • • • {Multisided remote control, comprising control or display elements on at least two sides, e.g. front and back surface}             | 9/18      | • Distinguishing marks on switches, e.g. for indicating switch location in the dark; Adaptation of switches to receive distinguishing marks             |
| 9/0264      | • • {Protective covers for terminals}  | 9/181     | • • {using a programmable display, e.g. LED or LCD}   |
| 9/0271      | • • {structurally combining a switch and an electronic component ( <a href="#">for relays H01H 50/021</a> )}                               |           |   |
| 2009/0278   | • • {Casings containing special noise reduction means, e.g. elastic foam between inner and outer casing}                                   |           |   |

- 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 electroluminescent 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
- 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
- 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 horns (using blow-out magnet [H01H 9/44](#))
- 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}  | 11/04    | . of switch contacts  |
| 2009/545  | . . . . {comprising a parallel semiconductor switch being fired optically, e.g. using a photocoupler,}  | 11/041   | . . {by bonding of a contact marking face to a contact body portion}  |
| 2009/546  | . . . . {the static switching means being triggered by the voltage over the mechanical switch contacts}   | 11/042   | . . . {by mechanical deformation}   |
| 9/547     | . . {Combinations of mechanical switches and static switches, the latter being controlled by the former}  | 11/043   | . . . {by resistance welding}   |
| 9/548     | . . {Electromechanical and static switch connected in series}   | 11/045   | . . . {with the help of an intermediate layer (contacts provided with a solder layer <a href="#">H01H 1/0231</a> )}   |
| 9/56      | . . for ensuring operation of the switch at a predetermined point in the AC cycle   | 2011/046 | . . . {by plating}  |
| 9/563     | . . . {for multipolar switches, e.g. different timing for different phases, selecting phase with first zero-crossing}   | 2011/047 | . . . {on both sides of the contact body portion}   |
| 2009/566  | . . . {with self learning, e.g. measured delay is used in later actuations}   | 11/048   | . . {by powder-metallurgical processes}   |
| 11/00     | <b>Apparatus or processes specially adapted for the 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, <a href="#">H01H 13/88</a>)</b>   | 11/06    | . . Fixing of contacts to carrier {; Fixing of contacts to insulating carrier}  |
| 11/0006   | . {for converting electric switches ( <a href="#">H01H 13/564</a> takes precedence)}  | 2011/062 | . . . {by inserting only}   |
| 11/0012   | . . {for converting normally open to normally closed switches and <i>vice versa</i> }   | 2011/065 | . . . {by plating metal or conductive rubber on insulating substrate, e.g. Molded Interconnect Devices [MID]}   |
| 11/0018   | . . {for allowing different operating parts}  | 2011/067 | . . . {by deforming, e.g. bending, folding or caulking, part of the contact or terminal which is being mounted}   |
| 2011/0025 | . . . {with provisions for allowing different orientation of the operating part, e.g. turning knob can be mounted in different positions}   | 13/00    | <b>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 <a href="#">H01H 17/00</a>)</b>  |
| 11/0031   | . . {for allowing different types or orientation of connections to contacts}  | 13/02    | . Details   |
| 2011/0037 | . . . {with removable or replaceable terminal blocks}   | 13/023   | . . {Light-emitting indicators (for multi-layer switches <a href="#">H01H 13/83</a> )}  |
| 2011/0043 | . . {for modifying the number or type of operating positions, e.g. momentary and stable}  | 2013/026 | . . . {with two or more independent lighting elements located inside the push button switch that illuminate separate zones of push buttons}   |
| 11/005    | . {of reed switches}  | 13/04    | . . Cases; Covers   |
| 11/0056   | . {comprising a successive blank-stamping, insert-moulding and severing operation}  | 13/06    | . . . Dustproof, splashproof, drip-proof, waterproof or flameproof casings  |
| 11/0062   | . {Testing or measuring non-electrical properties of switches, e.g. contact velocity ( <a href="#">monitoring contacts H01H 1/0015</a> ; <a href="#">monitoring gas density H01H 33/563</a> ; <a href="#">monitoring vacuum H01H 33/668</a> ; <a href="#">calibrating H01H 69/01</a> ; <a href="#">adjusting H01H 71/74</a> ; <a href="#">testing of electrical properties G01R 31/333</a> )} | 13/063   | . . . . {Casings hermetically closed by a diaphragm through which passes an actuating member ( <a href="#">vacuum switches H01H 33/66</a> )}  |
| 2011/0068 | . . {measuring the temperature of the switch or parts thereof}  | 2013/066 | . . . . {using bellows}   |
| 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}   | 13/08    | . . . Casing of switch constituted by a handle serving a purpose other than the actuation of the switch   |
| 2011/0081 | . {using double shot moulding, e.g. for forming elastomeric sealing elements on form stable casing}   | 13/10    | . . Bases; Stationary contacts mounted thereon  |
| 2011/0087 | . {Welding switch parts by use of a laser beam}   | 13/12    | . . Movable parts; Contacts mounted thereon   |
| 2011/0093 | . {Standardization, e.g. limiting the factory stock by limiting the number of unique, i.e. different components}  | 13/14    | . . . Operating parts, e.g. push-button   |
| 11/02     | . for mercury switches  | 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 ( <a href="#">H01H 13/186</a> , <a href="#">H01H 27/002</a> take precedence; the switch controlling enclosed equipment <a href="#">H01H 9/226</a> )}  |
|           |   | 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 ( <a href="#">depending upon deformation of elastic members H01H 13/26</a> )  |



- 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 rigid 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 (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 structure (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  | 17/18        | . . . secured to part of the switch driving mechanism that has only angular movement  |
| 13/86        | . . characterised by the casing, e.g. sealed casings or casings reducible in size   | 17/20        | . . . the contact returning to its original state immediately upon removal of operating force   |
| 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  | 17/22        | . . . the contact returning to its original state upon the next application of operating force  |
| <b>15/00</b> | <b>Switches having rectilinearly-movable operating part or parts adapted for actuation in opposite directions, e.g. slide switch</b>  | 17/24        | . . secured to a part of the switch driving mechanism that has both angular and rectilinear motion  |
| 15/005       | . {adapted for connection with printed circuit boards}  | 17/26        | . having two flexible operating parts; having a single operating part adapted for pulling at both ends  |
| 15/02        | . Details   | 17/28        | . . secured to part or parts of the switch driving mechanism having only rectilinear motion   |
| 15/025       | . . {Light-emitting indicators}   | 17/30        | . . secured to a part or parts of the switch driving mechanism having only angular motion   |
| 15/04        | . . Stationary parts; Contacts mounted thereon  | <b>19/00</b> | <b>Switches operated by an operating part which is rotatable about a longitudinal axis thereof and which is acted upon directly by a solid body external to the switch, e.g. by a hand</b>  |
| 15/06        | . . Movable parts; Contacts mounted thereon   | 19/001       | . {Thumb wheel switches}  |
| 15/08        | . . . Contact arrangements for providing make-before-break operation, e.g. for on-load tap-changing   | 19/003       | . . {having a pushbutton actuator}  |
| 15/10        | . . . Operating parts   | 19/005       | . {Electromechanical pulse generators}  |
| 15/102       | . . . . {comprising cam devices}  | 2019/006     | . . {being rotation direction sensitive, e.g. the generated pulse or code depends on the direction of rotation of the operating part}   |
| 15/105       | . . . . . {Adjustable cams}   | 2019/008     | . {with snap mounting of rotatable part on fixed part, e.g. rotor on stator, operating knob on switch panel}  |
| 15/107       | . . . . . {actuating conventional selfcontained microswitches (H01H 15/105 takes precedence)}   | 19/02        | . Details   |
| 15/12        | . . . . adapted for operation by a part of the human body other than the hand, e.g. by foot   | 19/025       | . . {Light-emitting indicators}   |
| 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 | 19/03        | . . Means for limiting the angle of rotation of the operating part  |
| 15/16        | . . . Driving mechanisms  | 19/04        | . . Cases; Covers   |
| 15/18        | . . . . acting with snap action   | 19/06        | . . . Dustproof, splashproof, drip-proof, waterproof, or flameproof casings   |
| 15/20        | . . . . with means for introducing a predetermined time delay   | 19/065       | . . . . {Casings hermetically closed by a diaphragm through which passes an actuating member (vacuum switches H01H 33/66)}  |
| 15/22        | . having a single operating part protruding from different sides of switch casing for alternate actuation from opposite ends  | 19/08        | . . Bases; Stationary contacts mounted thereon  |
| 15/24        | . having a single operating part only protruding from one side of the switch casing for alternate pushing and pulling   | 19/10        | . . Movable parts; Contacts mounted thereon   |
| <b>17/00</b> | <b>Switches having flexible operating part adapted only for pulling, e.g. cord, chain {(for emergency stop switches H01H 3/0226)}</b>   | 19/11        | . . . with indexing means   |
| 17/02        | . Details   | 19/115       | . . . . {using molded elastic parts only}   |
| 17/04        | . . Stationary parts (guides H01H 17/14)  | 19/12        | . . . Contact arrangements for providing make-before-break operation, e.g. for on-load tap-changing   |
| 17/06        | . . Movable parts (guides H01H 17/14)   | 19/14        | . . . Operating parts, e.g. turn knob   |
| 17/08        | . . . Operating part, e.g. cord   | 2019/143     | . . . . {having at least two concentric turn knobs}   |
| 17/10        | . . . . adapted for operation by a part of the human body other than the hand, e.g. by foot   | 2019/146     | . . . . {Roller type actuators}   |
| 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 | 19/16        | . . . . adapted for operation by a part of the human body other than the hand, e.g. by foot   |
| 17/14        | . . Guiding means for flexible operating part   | 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 |
| 17/16        | . having a single flexible operating part adapted for pulling at one end only   | 19/183       | . . . . . {adapted for operation by the simultaneous action of two cam plates, rotating at different speeds}  |
| 17/165       | . . {secured to a part of the switch mechanism that has only rectilinear movement}  | 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   |

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| 19/26   | . . . . with means for introducing a predetermined time delay  | 21/06    | . . . . interlocked with operating mechanism  |
| 19/28   | . . . . Driving mechanisms allowing angular displacement of the operating part to be effective or possible in only one direction   | 21/08    | . . . . Dustproof, splashproof, drip-proof, waterproof, or flameproof casings   |
| 19/30   | . . . . incorporating lost motion  | 21/085   | . . . . {Casings hermetically closed by a diaphragm through which passes an actuating member (vacuum switches H01H 33/66)}  |
| 19/32   | . . . . acting with snap action  | 21/10    | . . . . Casing of switch constituted by a handle serving a purpose other than the actuation of the switch   |
| 19/34   | . . . . with means for introducing a predetermined time delay  | 21/12    | . . . . Bases; Stationary contacts mounted thereon  |
| 19/36   | . . . . the operating part having only two operative positions, e.g. relatively displaced by 180 degrees   | 21/14    | . . . . Means for increasing contact pressure   |
| 19/38   | . . . . Change-over switches   | 21/16    | . . . . Adaptation for built-in fuse  |
| 19/40   | . . . . having only axial contact pressure   | 21/165   | . . . . {Fuses mounted on, or constituting the movable contact parts of, the switch}  |
| 19/42   | . . . . providing more than two electrically different conditions, e.g. for closing either or both of two circuits   | 21/18    | . . . . Movable parts; Contacts mounted thereon   |
| 19/44   | . . . . having only axial contact pressure   | 21/20    | . . . . Contact arrangements for providing make-before-break operation, e.g. for on-load tap-changing   |
| 19/46   | . . . . the operating part having three operative positions, e.g. off/star/delta   | 21/22    | . . . . Operating parts, e.g. handle  |
| 19/48   | . . . . having only axial contact pressure   | 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}  |
| 19/50   | . . . . the operating part having four operative positions, e.g. off/two-in-series/one-only/two-in-parallel  | 21/24    | . . . . . biased to return to normal position upon removal of operating force   |
| 19/52   | . . . . having only axial contact pressure   | 21/245   | . . . . . {the contact returning to its original state upon the next application of operating force}  |
| 19/54   | . . . . the operating part having at least five or an unspecified number of operative positions  | 21/26    | . . . . . adapted for operation by a part of the human body other than the hand, e.g. by foot   |
| 19/56   | . . . . Angularly-movable actuating part carrying contacts, e.g. drum switch   | 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 |
| 19/563  | . . . . {with an initial separation movement perpendicular to the switching movement}  | 21/282   | . . . . . {for actuation by moving a closing member, e.g. door, cover (the switch controlling enclosed equipment H01H 9/226)}   |
| 19/566  | . . . . {in which the contact making surfaces are inclined, i.e. not perpendicular, to the axial or radial direction}  | 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}  |
| 19/58   | . . . . having only axial contact pressure, e.g. disc switch, wafer switch   | 2021/287 | . . . . . {with adjustable head, e.g. the actuator head can have different positions in relation to the limit switch itself}  |
| 19/585  | . . . . {provided with printed circuit contacts}   | 21/30    | . . . . . not biased to return to a normal position upon removal of operating force   |
| 19/60   | . . . . Angularly-movable actuating part carrying no contacts  | 21/32    | . . . . . adapted for operation by a part of the human body other than the hand, e.g. by foot   |
| 19/605  | . . . . {in which the actuation of the contacts depends on the direction of rotation}  | 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 |
| 19/62   | . . . . Contacts actuated by radial cams   | 21/36    | . . . . . Driving mechanisms  |
| 19/623  | . . . . {Adjustable cams}  | 21/38    | . . . . . incorporating lost motion   |
| 19/626  | . . . . {actuating bridging contacts (H01H 19/623 takes precedence)}   | 21/40    | . . . . . having snap action  |
| 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   | <b>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)</b> |          |   |
| 21/02   | . . . . Details  |          |   |
| 21/025  | . . . . {Light-emitting indicators}  |          |   |
| 21/04   | . . . . Cases; Covers  |          |   |

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| 21/42        | . . . . . produced by compression or extension of coil spring  | 23/164       | . . . . . {with rectilinearly movable member carrying the contacts}   |
| 21/44        | . . . . . produced by flexing blade springs  | 23/166       | . . . . . {with positive action}  |
| 21/46        | . . . . . with two or more snap-action motions in succession   | 23/168       | . . . . . {using cams}  |
| 21/48        | . . . . . incorporating a ratchet mechanism  | 23/18        | . . . . . incorporating lost motion   |
| 21/50        | . . . . . with indexing or latching means, e.g. indexing by ball and spring; with means to ensure stopping at intermediate operative positions   | 23/20        | . . . . . having snap action  |
| 21/52        | . . . . . with means for introducing a predetermined time delay  | 23/205       | . . . . . {using a compression spring between tumbler and an articulated contact plate}   |
| 21/54        | . Lever switches with blade-type contact co-operating with one or two spring-clip contacts, e.g. knife switch  | 23/22        | . . . . . with means for introducing a predetermined time delay   |
| 21/56        | . . making contact in one position only  | 23/24        | . with two operating positions  |
| 21/58        | . . Change-over switches without stable intermediate position  | 23/26        | . . one of which positions is unstable  |
| 21/60        | . . Change-over switches with stable intermediate position   | 23/28        | . with three operating positions  |
| 21/86        | . Switches with abutting contact carried by operating part, e.g. telegraph tapping key   | 23/30        | . . with stable centre positions and one or both end positions unstable   |
| 21/88        | . . with intermediate position of rest   |              |   |
| <b>23/00</b> | <b>Tumbler or rocker switches, i.e. switches characterised by being operated by rocking an operating member in the form of a rocker button</b>   | <b>25/00</b> | <b>Switches with compound movement of handle or other operating part</b>  |
|              | <b>NOTE</b>  | 25/002       | . {having an operating member rectilinearly slidable in different directions}   |
|              | 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 | 2025/004     | . . {the operating member being depressable perpendicular to the other directions}  |
| 23/003       | . {with more than one electrically distinguishable condition in one or both positions}   | 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}  |
| 23/006       | . {adapted for connection with printed circuit boards}   | 25/008       | . {Operating part movable both angularly and rectilinearly, the rectilinear movement being perpendicular to the axis of angular movement}   |
| 23/02        | . Details  | 25/04        | . Operating part movable angularly in more than one plane, e.g. joystick  |
| 23/025       | . . {Light-emitting indicators}  | 25/041       | . . {having a generally flat operating member depressible at different locations to operate different controls}   |
| 23/04        | . . Cases; Covers  | 2025/043     | . . . {the operating member being rotatable around wobbling axis for additional switching functions}  |
| 23/06        | . . . Dustproof, splashproof, drip-proof, waterproof, or flameproof casings  | 2025/045     | . . . {having a rotating dial around the operating member for additional switching functions}   |
| 23/065       | . . . . . {Casings hermetically closed by a diaphragm through which passes an actuating member (vacuum switches <a href="#">H01H 33/66</a> )}  | 2025/046     | . . . {having a spherical bearing between operating member and housing or bezel}  |
| 23/08        | . . Bases; Stationary contacts mounted thereon   | 2025/048     | . . {having a separate central push, slide or tumbler button which is not integral with the operating part that surrounds it}   |
| 23/10        | . . Adaptation for built-in fuse   | 25/06        | . Operating part movable both angularly and rectilinearly, the rectilinear movement being along the axis of angular movement  |
| 23/105       | . . . {Fuses mounted on, or constituting the movable part of, the switch}  | 25/065       | . . {using separate operating parts, e.g. a push button surrounded by a rotating knob}  |
| 23/12        | . . Movable parts; Contacts mounted thereon  |              |   |
| 23/14        | . . . Tumblers   | <b>27/00</b> | <b>Switches operated by a removable member, e.g. key, plug or plate; Switches operated by setting members according to a single predetermined combination out of several possible settings (combined with plug-and-socket connectors <a href="#">H01R 13/70</a>; with current-carrying plug <a href="#">H01R 31/08</a>)</b> |
| 23/141       | . . . . . {provided with extensions, e.g. for actuation by a child}  | 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}  |
| 23/143       | . . . . . {having a generally flat elongated shape}  | 2027/005     | . . {the key receiving part having multiple openings to allow keys from different directions to operate the switch}   |
| 23/145       | . . . . . {the actuating surface having two slightly inclined areas extending from the middle outward}   | 27/007       | . . {the switch being lockable by remote control, e.g. by electromagnet}  |
| 23/146       | . . . . . {having a generally tubular or conical elongated shape, e.g. dolly}  |              |   |
| 23/148       | . . . . . {actuated by superimposed sliding element ( <a href="#">H01H 23/141</a> takes precedence)}   |              |   |
| 23/16        | . . . Driving mechanisms   |              |   |
| 23/162       | . . . . . {incorporating links interconnecting tumbler and contact arm}  |              |   |



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| 27/04        | • Insulating plug or plate inserted between normally closed contacts   | 31/003       | • {Earthing switches ( <a href="#">H01H 31/02</a> - <a href="#">H01H 31/26</a> take precedence; contact made by liquid jet <a href="#">H01H 29/32</a> ; for substations <a href="#">H02B 1/16</a> , <a href="#">H02B 5/01</a> ; for withdrawable switchgear <a href="#">H02B 11/28</a> ; for gas-insulated switchgear <a href="#">H02B 13/075</a> )} |
| 27/06        | • Key inserted and then turned to effect operation of the switch   | 31/006       | • {adapted to be operated by a hot stick; Hot sticks therefor}   |
| 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}  | 31/02        | • Details  |
| 2027/066     | • • {having anti-tamper provisions, e.g. avoiding the removal of the lock cylinder}  | 31/023       | • • {Base and stationary contacts mounted thereon}   |
| 27/08        | • • wherein the key cannot be removed until the switch is returned to its original position {( <a href="#">H01H 27/063</a> takes precedence)}  | 31/026       | • • {Movable parts and contacts mounted thereon}   |
| 27/10        | • Switch operated by setting members according to a single predetermined combination out of several possible settings  | 31/04        | • • Interlocking mechanisms  |
| <b>29/00</b> | <b>Switches having at least one liquid contact (solid contacts wetted or soaked with mercury <a href="#">H01H 1/08</a>)</b>  | 31/06        | • • • for interlocking between casing, cover, or protective shutter and mechanism for operating contacts   |
| 29/002       | • {Inertia switches}   | 31/08        | • • • for interlocking two or more parts of the mechanism for operating contacts   |
| 29/004       | • {Operated by deformation of container}   | 31/10        | • • • for interlocking two or more switches  |
| 29/006       | • {Self interrupters, e.g. with periodic or other repetitive opening and closing of contacts}  | 31/12        | • • Adaptation for built-in fuse   |
| 2029/008     | • {using micromechanics, e.g. micromechanical liquid contact switches or [LIMMS]}  | 31/122       | • • • {Fuses mounted on, or constituting the movable contact parts of, the switch}   |
| 29/02        | • Details  | 31/125       | • • • • {with a pivotally supported fuse, hanging on a fixed contact in the open position of the switch ( <a href="#">H01H 31/127</a> takes precedence)}   |
| 29/04        | • • Contacts; Containers for liquid contacts   | 31/127       | • • • • {Drop-out fuses}   |
| 29/06        | • • • Liquid contacts characterised by the material thereof  | 31/14        | • with bridging contact that is not electrically connected to either line contact in open position of switch   |
| 29/08        | • • Means for introducing a predetermined time delay   | 31/16        | • • with angularly-movable bridging contact or contact-carrying member   |
| 29/10        | • • • by constricting the flow of the contact liquid   | 31/18        | • • • actuated through the movement of one or more insulators  |
| 29/12        | • • Operating mechanisms adapted for operation by a part of the human body other than the hand, e.g. by foot   | 31/20        | • • • • at least one insulator being rotatable about its own geometrical axis  |
| 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 | 31/22        | • • • wherein the contact or contacts are rectilinearly movable with respect to the carrying member  |
| 29/16        | • operated by dipping solid contact into stationary contact liquid   | 31/24        | • • with rectilinearly-movable bridging contact  |
| 29/18        | • with level of surface of contact liquid displaced by non-electrical contact-making plunger   | 31/26        | • with movable contact that remains electrically connected to one line in open position of switch  |
| 29/20        | • operated by tilting contact-liquid container   | 31/28        | • • with angularly-movable contact   |
| 29/22        | • • wherein contact is made and broken between liquid and solid  | 31/283       | • • • {wherein the contact or contacts are rectilinearly movable with respect to the carrying member}  |
| 29/24        | • • wherein contact is made and broken between liquid and liquid   | 2031/286     | • • • {wherein the contact is rotatable around its own longitudinal axis}  |
| 29/26        | • with level of surface of contact liquid displaced by centrifugal action  | 31/30        | • • • actuated through the movement of one or more insulators  |
| 29/28        | • with level of surface of contact liquid displaced by fluid pressure  | 31/32        | • • with rectilinearly-movable contact   |
| 29/30        | • with level of surface of contact liquid displaced by expansion or evaporation thereof  | 31/34        | • with movable contact adapted to engage an overhead transmission line, e.g. for branching   |
| 29/32        | • with contact made by a liquid jet, e.g. earthing switch with contact made by jet of water  | 31/36        | • • Contact moved by pantograph  |
| <b>31/00</b> | <b>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 <a href="#">H01H 33/00</a>)</b>  | <b>33/00</b> | <b>High-tension or heavy-current switches with arc-extinguishing or arc-preventing means</b>   |
|              |  | 33/002       | • {Very heavy-current switches ( <a href="#">H01H 33/02</a> - <a href="#">H01H 33/98</a> take precedence)}   |
|              |  | 33/004       | • • {making use of superconducting contacts (current limitation using superconducting elements <a href="#">H02H 9/023</a> ; power cryotrons <a href="#">H10N 60/355</a> )}   |
|              |  | 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<sub>6</sub>}
- 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
- 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 than 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<sub>6</sub>-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](#))}
- 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](#))
- 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
- 33/38 . . . . using electromagnet
- 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}   | 33/664    | . . . . Contacts; Arc-extinguishing means, e.g. arcing rings   |
| 33/562     | . . . . {Means for avoiding liquefaction or for disposing of liquefaction products}   | 33/6641   | . . . . {making use of a separate coil}  |
| 33/563     | . . . . {comprising means for monitoring the density of the insulating gas}   | 33/6642   | . . . . {having cup-shaped contacts, the cylindrical wall of which being provided with inclined slits to form a coil}  |
| 33/565     | . . . . {Gas-tight sealings for moving parts penetrating into the reservoir}  | 33/6643   | . . . . {having disc-shaped contacts subdivided in petal-like segments, e.g. by helical grooves}   |
| 2033/566   | . . . . {Avoiding the use of SF <sub>6</sub> }  | 33/6644   | . . . . {having coil-like electrical connections between contact rod and the proper contact}   |
| 2033/567   | . . . . {Detection of decomposition products of the gas}  | 33/6645   | . . . . {in which the coil like electrical connections encircle at least once the contact rod}   |
| 2033/568   | . . . . {with overpressure release, e.g. rupture membranes}   | 33/6646   | . . . . {having non flat disc-like contact surface}  |
| 33/57      | . . . . Recuperation of liquid or gas   | 33/6647   | . . . . {having fixed middle contact and two movable contacts}   |
| 33/58      | . . . . Silencers for suppressing noise of switch operation   | 2033/6648 | . . . . {Contacts containing flexible parts, e.g. to improve contact pressure}   |
| 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 | 33/666    | . . . . Operating arrangements   |
| 33/593     | . . . . {for ensuring operation of the switch at a predetermined point of the AC cycle (for multipolar switches <a href="#">H01H 9/563</a> )}   | 33/6661   | . . . . {Combination with other type of switch, e.g. for load break switches ( <a href="#">H01H 33/143</a> , <a href="#">H01H 33/6662</a> take precedence)}          |
| 33/596     | . . . . {for interrupting DC}   | 33/6662   | . . . . {using bistable electromagnetic actuators, e.g. linear polarised electromagnetic actuators}  |
| 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                                  | 33/6664   | . . . . {with pivoting movable contact structure}  |
| 33/64      | . . . . wherein the break is in gas ( <a href="#">vacuum switches H01H 33/66</a> )  | 2033/6665 | . . . . {Details concerning the mounting or supporting of the individual vacuum bottles}   |
| 33/65      | . . . . wherein the break is in air at atmospheric pressure, e.g. in open air   | 2033/6667 | . . . . {Details concerning lever type driving rod arrangements}   |
| 33/66      | . . . . Vacuum switches   | 2033/6668 | . . . . {with a plurality of interruptible circuit paths in single vacuum chamber}   |
| 33/6606    | . . . . {Terminal arrangements}   | 33/668    | . . . . Means for obtaining or monitoring the vacuum   |
| 2033/6613  | . . . . {Cooling arrangements directly associated with the terminal arrangements}   | 33/6683   | . . . . {by gettering}   |
| 33/662     | . . . . Housings or protective screens  | 2033/6686 | . . . . {by emitting and receiving reflected sound or ultrasound signals}  |
| 33/66207   | . . . . {Specific housing details, e.g. sealing, soldering or brazing}  | 33/68     | . . . . Liquid-break switches, e.g. oil-break  |
| 2033/66215 | . . . . {Details relating to the soldering or brazing of vacuum switch housings}  | 33/70     | . . . . Switches with separate means for directing, obtaining, or increasing flow of arc-extinguishing fluid   |
| 2033/66223 | . . . . {Details relating to the sealing of vacuum switch housings}   | 33/7007   | . . . . {wherein the flow is a function of the current being interrupted}  |
| 2033/6623  | . . . . {Details relating to the encasing or the outside layers of the vacuum switch housings}  | 33/7015   | . . . . {characterised by flow directing elements associated with contacts ( <a href="#">electrical or mechanical properties of the contact system H01H 1/385</a> )} |
| 33/66238   | . . . . {Specific bellows details}  | 33/7023   | . . . . {characterised by an insulating tubular gas flow enhancing nozzle ( <a href="#">H01H 33/7038</a> takes precedence)}  |
| 2033/66246 | . . . . {Details relating to the guiding of the contact rod in vacuum switch bellows}   | 33/703    | . . . . {having special gas flow directing elements, e.g. grooves, extensions}   |
| 2033/66253 | . . . . {Details relating to the prevention of unwanted rotation of the contact rod in vacuum switch bellows}   | 33/7038   | . . . . {characterised by a conducting tubular gas flow enhancing nozzle}  |
| 33/66261   | . . . . {Specific screen details, e.g. mounting, materials, multiple screens or specific electrical field considerations}   | 33/7046   | . . . . {having special gas flow directing elements, e.g. grooves, extensions ( <a href="#">H01H 33/7053</a> takes precedence)}                                      |
| 2033/66269 | . . . . {Details relating to the materials used for screens in vacuum switches}   | 33/7053   | . . . . {having a bridging element around two hollow tubular contacts}   |
| 2033/66276 | . . . . {Details relating to the mounting of screens in vacuum switches}  | 33/7061   | . . . . {characterised by use of special mounting means ( <a href="#">H01H 33/7023</a> - <a href="#">H01H 33/7038</a> take precedence)}                              |
| 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}  |           |  |

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| 33/7069  | . . . {characterised by special dielectric or insulating properties or by special electric or magnetic field control properties ( <a href="#">H01H 33/7023</a> - <a href="#">H01H 33/7061</a> take precedence)} | 33/905       | . . . . {the compression volume being formed by a movable cylinder and a semi-mobile piston}  |
| 33/7076  | . . . {characterised by the use of special materials ( <a href="#">H01H 33/7023</a> - <a href="#">H01H 33/7069</a> take precedence)}  | 2033/906     | . . . . {with pressure limitation in the compression volume, e.g. by valves or bleeder openings}  |
| 33/7084  | . . . {characterised by movable parts influencing the gas flow ( <a href="#">H01H 33/7023</a> - <a href="#">H01H 33/7076</a> take precedence)}  | 2033/907     | . . . . {using tandem pistons, e.g. several compression volumes being modified in conjunction or sequential}  |
| 33/7092  | . . . {characterised by several arcing chambers in series ( <a href="#">H01H 33/7023</a> - <a href="#">H01H 33/7084</a> take precedence)}   | 2033/908     | . . . . {using valves for regulating communication between, e.g. arc space, hot volume, compression volume, surrounding volume}   |
| 33/72    | . . having stationary parts for directing the flow of arc-extinguishing fluid, e.g. arc-extinguishing chamber   | 33/91        | . . . . the arc-extinguishing fluid being air or gas  |
| 33/73    | . . . wherein the break is in air at atmospheric pressure, e.g. in open air   | 2033/912     | . . . . . {Liquified gases, e.g. liquified SF <sub>6</sub> }  |
| 33/74    | . . . wherein the break is in gas ( <a href="#">in air at atmospheric pressure H01H 33/73</a> )   | 33/92        | . . . . the arc-extinguishing fluid being liquid, e.g. oil  |
| 33/75    | . . . Liquid-break switches, e.g. oil-break   | 33/94        | . . . this movement being effected solely due to the pressure caused by the arc itself or by an auxiliary arc ( <a href="#">H01H 33/903</a> takes precedence)}  |
| 33/76    | . . wherein arc-extinguishing gas is evolved from stationary parts; Selection of material therefor  | 33/95        | . . . . the arc-extinguishing fluid being air or gas  |
| 33/765   | . . . {the gas-evolving material being incorporated in the contact material}  | 33/96        | . . . . the arc-extinguishing fluid being liquid, e.g. oil  |
| 33/77    | . . . wherein the break is in air at atmospheric pressure   | 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 ( <a href="#">H01H 33/901</a> takes precedence)}   |
| 33/78    | . . . wherein the break is in gas ( <a href="#">in air at atmospheric pressure H01H 33/77</a> )   | 33/982       | . . . {in which the pressure-generating arc is rotated by a magnetic field}   |
| 33/80    | . . flow of arc-extinguishing fluid from a pressure source being controlled by a valve  | <b>35/00</b> | <b>Switches operated by change of a physical condition (operated by change of magnetic or electric field <a href="#">H01H 36/00</a>; thermally-actuated switches <a href="#">H01H 37/00</a>)</b>  |
| 33/82    | . . . the fluid being air or gas  |              | <b>NOTE</b>   |
| 33/83    | . . . . wherein the contacts are opened by the flow of air or gas   |              | 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 <a href="#">H01H 35/24</a> , an explosion produced within the switch in group <a href="#">H01H 37/00</a> if initiated by heat, in group <a href="#">H01H 39/00</a> if initiated electrically, and in group <a href="#">H01H 35/14</a> if initiated by an external blow. |
| 33/84    | . . . the fluid being liquid, e.g. oil  | 35/003       | . {Switches operated by other part of human body than hands ( <a href="#">push-button switches H01H 13/16</a> ; <a href="#">slide switches H01H 15/20</a> ; <a href="#">cord switches H01H 17/10</a> ; <a href="#">other switches H01H 19/16</a> and <a href="#">H01H 21/26</a> )}  |
| 33/85    | . . . . wherein the contacts are opened by the flow of liquid   | 35/006       | . {Switches operated by mechanical overload condition, e.g. transmitted force or torque becoming too high}  |
| 33/86    | . . the flow of arc-extinguishing fluid under pressure from the contact space being controlled by a valve   | 35/02        | . Switches operated by change of position, inclination or orientation of the switch itself in relation to gravitational field ( <a href="#">tilting mercury container H01H 29/20</a> ; <a href="#">change of position due to change of liquid level H01H 35/18</a> )  |
| 33/88    | . . the flow of arc-extinguishing fluid being produced or increased by movement of pistons or other pressure-producing parts  | 35/022       | . . {the switch being of the reed switch type}  |
| 33/882   | . . . {the movement being assisted by accelerating coils}   | 35/025       | . . {the switch being discriminative in different directions}   |
| 33/884   | . . . {with variable-area piston}   | 35/027       | . . {the inertia mass activating the switch mechanically, e.g. through a lever}   |
| 33/886   | . . . {by movement of rotating pistons}   | 35/06        | . Switches operated by change of speed ( <a href="#">operated by change of fluid flow H01H 35/24</a> )  |
| 2033/888 | . . . {Deflection of hot gasses and arcing products}  | 35/10        | . . Centrifugal switches ( <a href="#">level of mercury displaced by centrifugal action H01H 29/26</a> )  |
| 33/90    | . . . this movement being effected by or in conjunction with the contact-operating mechanism  | 35/12        | . . operated by reversal of direction of movement   |
| 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}   |              |   |



- 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 [\(by magnet carried on a float H01H 36/02\)](#)
- 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**
- 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**
- 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

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| 37/18     | . . . by varying bias on the thermal element due to a separate spring  | 2037/5472 | . . . . {having an omega form, e.g. the bimetallic snap element having a ring shape with a central tongue}  |
| 37/20     | . . . by varying the position of the thermal element in relation to switch base or casing  | 2037/5481 | . . . . {the bimetallic snap element being mounted on the contact spring}   |
| 37/22     | . . . by adjustment of a member transmitting motion from the thermal element to contacts or latch  | 2037/549  | . . . . {Details of movement transmission between bimetallic snap element and contact}  |
| 37/24     | . . . by adjustment of position of the movable contact on its driving member   | 37/56     | . . . . having spirally wound or helically wound bimetallic element   |
| 37/26     | . . . by adjustment of abutment for "off" position of the movable contact  | 37/58     | . . . actuated due to thermally controlled change of magnetic permeability  |
| 37/28     | . . . by adjustment of the position of the fixed contact   | 37/585    | . . . . {the switch being of the reed switch type}  |
| 37/30     | . . . by varying the position of the contact unit in relation to switch base or casing   | 37/60     | . . Means for producing snap action (inherent in bimetallic element <a href="#">H01H 37/54</a> ; caused by a magnet <a href="#">H01H 37/66</a> )      |
| 37/32     | . . Thermally-sensitive members  | 37/62     | . . Means other than thermal means for introducing a predetermined time delay   |
| 37/323    | . . . {making use of shape memory materials (in thermal relays <a href="#">H01H 61/0107</a> ; release mechanism <a href="#">H01H 71/145</a> ; treatment of SMF alloys <a href="#">C22F 1/006</a> ; for control of temperature <a href="#">G05D 23/024</a> )} | 37/64     | . . Contacts  |
| 2037/326  | . . . {with radiative heat transfer to the switch, e.g. special absorption surfaces}   | 37/66     | . . . Magnetic reinforcement of contact pressure; Magnet causing snap action  |
| 37/34     | . . . Means for transmitting heat thereto, e.g. capsule remote from contact member   | 37/68     | . . . sealed in evacuated or gas-filled tube  |
| 37/36     | . . . actuated due to expansion or contraction of a fluid with or without vaporisation (the fluid forming a contact of the switch <a href="#">H01H 29/04</a> , <a href="#">H01H 29/30</a> )  | 37/70     | . . . Resetting means {( <a href="#">H01H 37/5409</a> takes precedence)}  |
| 37/38     | . . . . with bellows   | 2037/705  | . . . . {wherein the switch cannot be closed when the temperature is above a certain value}   |
| 37/40     | . . . . with diaphragm   | 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         |
| 37/42     | . . . . with curled flexible tube, e.g. Bourdon tube   | 37/74     | . Switches in which only the opening movement or only the closing movement of a contact is effected by heating or cooling                             |
| 37/44     | . . . . with piston and cylinder   | 37/76     | . . Contact member actuated by melting of fusible material, actuated due to burning of combustible material or due to explosion of explosive material |
| 37/46     | . . . actuated due to expansion or contraction of a solid (deflection of a bimetallic element <a href="#">H01H 37/52</a> )   | 37/761    | . . . {with a fusible element forming part of the switched circuit ( <a href="#">H01H 37/767</a> takes precedence)}                                   |
| 37/48     | . . . . with extensible rigid rods or tubes  | 2037/762  | . . . . {using a spring for opening the circuit when the fusible element melts}   |
| 37/50     | . . . . with extensible wires under tension  | 2037/763  | . . . . {the spring being a blade spring}   |
| 37/52     | . . . actuated due to deflection of bimetallic element   | 37/764    | . . . {in which contacts are held closed by a thermal pellet}   |
| 37/521    | . . . . {comprising a plurality of bimetallic elements acting in the same direction}   | 37/765    | . . . . {using a sliding contact between a metallic cylindrical housing and a central electrode}  |
| 2037/523  | . . . . {using a corrugated bimetal}   | 37/766    | . . . . {using a bridging contact}  |
| 2037/525  | . . . . {Details of manufacturing of the bimetallic elements, e.g. connection to non bimetallic elements or insulating coatings}   | 37/767    | . . . {Normally open}   |
| 2037/526  | . . . . {Materials for bimetallic elements}  | 2037/768  | . . . {characterised by the composition of the fusible material}  |
| 2037/528  | . . . . {the bimetallic element being composed of more than two layers}  | 2037/769  | . . . {characterised by the composition of insulating fusible materials, e.g. for use in the thermal pellets}   |
| 37/54     | . . . . wherein the bimetallic element is inherently snap acting   | 39/00     | <b>Switching devices actuated by an explosion produced within the device and initiated by an electric current</b>                                     |
| 37/5409   | . . . . {Bistable switches; Resetting means}   | 39/002    | . {provided with a cartridge-magazine}  |
| 37/5418   | . . . . {using cantilevered bimetallic snap elements}  | 39/004    | . {Closing switches}  |
| 37/5427   | . . . . {encapsulated in sealed miniaturised housing}  | 39/006    | . {Opening by severing a conductor}   |
| 37/5436   | . . . . {mounted on controlled apparatus}  | 2039/008  | . {using the switch for a battery cutoff}   |
| 2037/5445 | . . . . {with measures for avoiding slow break of contacts during the creep phase of the snap bimetal}   | 41/00     | <b>Switches providing a selected number of consecutive operations of the contacts by a single manual actuation of the operating part</b>              |
| 2037/5454 | . . . . {with separate spring biasing the bimetallic snap element against the heat transfer surface}   |           |   |
| 2037/5463 | . . . . {the bimetallic snap element forming part of switched circuit}   |           |   |

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| 41/04        | Switches without means for setting or mechanically storing a multidigit number   | 43/26         | the actuation being produced by a substance flowing due to gravity, e.g. sand, water   |
| 41/06        | . . dial or slide operated   | 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  |
| 41/08        | . . keyboard operated  | 43/285        | . . . {adjusting the time interval by means of an adjustable orifice, e.g. needle valve}   |
| 41/10        | Switches with means for setting or mechanically storing a multidigit number  | 43/30         | with timing of actuation of contacts due to thermal action   |
| 41/12        | . . dial or slide operated   | 43/301        | . . {based on the expansion or contraction of a material (thermometers based on the expansion or contraction of a material <a href="#">G01K 5/00</a> )}  |
| 41/14        | . . keyboard operated  | 43/302        | . . . {of solid bodies}  |
| <b>43/00</b> | <b>Time or time-programme switches providing a choice of time-intervals for executing one or more switching actions and automatically terminating their operation after the programme is completed</b> | 43/303        | . . . . {of one single solid body, e.g. hot wire}  |
| 43/005       | . {with timing of the actuation of contacts due to a part rotating at variable speed}  | 43/304        | . . . . {of two bodies expanding or contracting in a different manner, e.g. bimetallic elements}   |
| 43/02        | . Details  | 43/305        | . . . . . {actuating the contacts by commanding a mechanical device, e.g. thermal motor}   |
| 43/022       | . . {Bases; Housings; Mountings}   | 43/306        | . . . {of liquids}   |
| 43/024       | . . {Terminal arrangements}  | 43/307        | . . . {of gases}   |
| 43/026       | . . {Contact arrangements}   | 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 <a href="#">G01K 7/00</a> )}                              |
| 43/028       | . . {Means for manually actuating the contacts or interfering with the cooperation between timer mechanism and contacts}   | 43/309        | . . {based on the change of magnetic properties (thermometers based on the use of electric or magnetic elements directly sensitive to heat <a href="#">G01K 7/00</a> )}  |
| 43/04        | . . Means for time setting   | 43/32         | with timing of actuation of contacts due to electrolytic processes; with timing of actuation of contacts due to chemical processes   |
| 43/06        | . . . comprising separately adjustable parts for each programme step, e.g. with tappets  | 43/322        | . . {Electrolytic decomposition of liquids, e.g. actuation of contacts due to action of the products of reaction}  |
| 43/065       | . . . . {using cams or discs supporting a plurality of individually programmable elements (Schaltreiter)}  | 43/325        | . . {Electrolytic decomposition of solid bodies, e.g. action by rupture}   |
| 43/08        | . . . comprising an interchangeable programme part which is common for all programme steps, e.g. with a punched card   | 43/327        | . . {acting by coulometric transfer of material}   |
| 43/10        | with timing of actuation of contacts due to a part rotating at substantially constant speed  |               |  |
| 43/101       | . . {Driving mechanisms}   | <b>Relays</b> |  |
| 43/102       | . . . {using a pawl and ratchet wheel mechanism}   | <b>45/00</b>  | <b>Details of relays (electric circuit arrangements <a href="#">H01H 47/00</a>; of electromagnetic relays <a href="#">H01H 50/00</a>; details of electrically-operated selector switches <a href="#">H01H 63/00</a>)</b> |
| 43/103       | . . {stopping automatically after one preselected time interval}   | 45/02         | . Bases; Casings; Covers (frames for mounting two or more relays or for mounting a relay and another electric component <a href="#">H02B 1/01</a> , <a href="#">H04Q 1/08</a> , <a href="#">H05K</a> )                   |
| 43/104       | . . . {by mechanical coupling device}  | 45/04         | . . Mounting complete relay or separate parts of relay on a base or inside a case  |
| 43/105       | . . . {by electromechanical coupling device}   | 45/06         | . . having windows; Transparent cases or covers  |
| 43/106       | . . {Manual programme selecting means}   | 45/08         | . Indicators; Distinguishing marks   |
| 2043/107     | . . . {Bidirectional selecting means, e.g. the programme selecting knob being turnable in both directions}   | 45/10         | . Electromagnetic or electrostatic shielding ( <a href="#">casings <a href="#">H01H 45/02</a></a> )  |
| 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}                    | 45/12         | . Ventilating; Cooling; Heating ( <a href="#">for operating electrothermal relays <a href="#">H01H 61/013</a></a> )  |
| 43/12        | . . stopping automatically after a single cycle of operation   | 45/14         | . Terminal arrangements  |
| 43/121       | . . . {using a drum}   | <b>47/00</b>  | <b>Circuit arrangements not adapted to a particular application of the relay and designed to obtain desired operating characteristics or to provide energising current</b>   |
| 43/122       | . . . . {with provision for adjustment of the intervals by a non-rotating member}  | 47/001        | . {Functional circuits, e.g. logic, sequencing, interlocking circuits}   |
| 43/124       | . . . {using a disc}   | 47/002        | . {Monitoring or fail-safe circuits}   |
| 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  |               |  |

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| 2047/003 | . . {Detecting welded contacts and applying weld break pulses to coil}  | 50/005   | . {using micromechanics}   |
| 47/004   | . . {using plural redundant serial connected relay operated contacts in controlled circuit}   | 2050/007 | . . {Relays of the polarised type, e.g. the MEMS relay beam having a preferential magnetisation direction}   |
| 47/005   | . . . {Safety control circuits therefor, e.g. chain of relays mutually monitoring each other}   | 50/02    | . Bases; Casings; Covers (frames for mounting two or more relays or for mounting a relay and another electric component <a href="#">H02B 1/01</a> , <a href="#">H04Q 1/08</a> , <a href="#">H05K</a> ) |
| 2047/006 | . . {Detecting unwanted movement of contacts and applying pulses to coil for restoring to normal status}  | 50/021   | . . {structurally combining a relay and an electronic component, e.g. varistor, RC circuit (auxiliary switch inserting resistor during closure <a href="#">H01H 50/543</a> )}                          |
| 47/007   | . {with galvanic isolation between controlling and controlled circuit, e.g. transformer relay}  | 50/023   | . . {Details concerning sealing, e.g. sealing casing with resin}   |
| 2047/008 | . {with a drop in current upon closure of armature or change of inductance}   | 2050/025 | . . . {containing inert or dielectric gasses, e.g. SF <sub>6</sub> , for arc prevention or arc extinction}   |
| 2047/009 | . {with self learning features, e.g. measuring the attracting current for a relay and memorising it}  | 50/026   | . . {Details concerning isolation between driving and switching circuit}   |
| 47/02    | . for modifying the operation of the relay  | 2050/028 | . . {Means to improve the overall withstanding voltage, e.g. creepage distances}   |
| 2047/025 | . . {with taking into account of the thermal influences, e.g. change in resistivity of the coil or being adapted to high temperatures}  | 50/04    | . . Mounting complete relay or separate parts of relay on a base or inside a case  |
| 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 <a href="#">H01H 47/325</a> )} | 50/041   | . . . {Details concerning assembly of relays}  |
| 47/043   | . . . {making use of an energy accumulator (for bistable relays <a href="#">H01H 47/226</a> )}  | 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}                                |
| 2047/046 | . . . {with measuring of the magnetic field, e.g. of the magnetic flux, for the control of coil current}  | 50/043   | . . . . {Details particular to miniaturised relays ( <a href="#">H01H 50/042</a> takes precedence)}  |
| 47/06    | . . . by changing number of serially-connected turns or windings  | 2050/044 | . . . . . {Special measures to minimise the height of the relay}   |
| 47/08    | . . . by changing number of parallel-connected turns or windings  | 50/045   | . . . . {Details particular to contactors ( <a href="#">H01H 50/042</a> takes precedence)}   |
| 47/10    | . . . by switching-in or -out impedance external to the relay winding   | 2050/046 | . . . . {Assembling parts of a relay by using snap mounting techniques}  |
| 47/12    | . . for biasing the electromagnet   | 50/047   | . . . {Details concerning mounting a relays}   |
| 47/14    | . . for differential operation of the relay   | 50/048   | . . . . {Plug-in mounting or sockets}  |
| 47/16    | . . for conjoint, e.g. additive, operation of the relay   | 2050/049 | . . . {Assembling or mounting multiple relays in one common housing}   |
| 47/18    | . . for introducing delay in the operation of the relay (short-circuited conducting sleeves, bands or discs <a href="#">H01H 50/46</a> )  | 50/06    | . . having windows; Transparent cases or covers  |
| 47/20    | . . for producing frequency-selective operation of the relay  | 50/08    | . Indicators; Distinguishing marks   |
| 47/22    | . for supplying energising current for relay coil   | 50/10    | . Electromagnetic or electrostatic shielding ( <a href="#">casings H01H 50/02</a> )  |
| 47/223   | . . {adapted to be supplied by AC}  | 50/12    | . Ventilating; Cooling; Heating (for operating electrothermal relays <a href="#">H01H 61/013</a> )   |
| 47/226   | . . {for bistable relays}   | 50/14    | . Terminal arrangements {(for coils <a href="#">H01H 50/443</a> )}   |
| 47/24    | . . having light-sensitive input  | 50/16    | . Magnetic circuit arrangements  |
| 47/26    | . . having thermo-sensitive input   | 50/163   | . . {Details concerning air-gaps, e.g. anti-remance, damping, anti-corrosion}  |
| 47/28    | . . Energising current supplied by discharge tube   | 2050/166 | . . {wherein the magnetic circuit parts are molded in a magnetic plastic material}   |
| 47/30    | . . . by gas-filled discharge tube  | 50/18    | . . Movable parts of magnetic circuits, e.g. armature  |
| 47/32    | . . Energising current supplied by semiconductor device   | 50/20    | . . . movable inside coil and substantially lengthwise with respect to axis thereof; movable coaxially with respect to coil  |
| 47/325   | . . . {by switching regulator}  | 50/22    | . . . . wherein the magnetic circuit is substantially closed   |
| 47/34    | . . Energising current supplied by magnetic amplifier   | 2050/225 | . . . . . {with yoke and armature formed by identical stacked laminates, e.g. punched in one and the same tool}  |
| 47/36    | . . Relay coil or coils forming part of a bridge circuit  | 50/24    | . . . Parts rotatable or rockable outside coil   |
| 49/00    | <b>Apparatus or processes specially adapted to the manufacture of relays or parts thereof</b>   | 50/26    | . . . . Parts movable about a knife edge   |
| 50/00    | <b>Details of electromagnetic relays ({<a href="#">H01H 51/28</a> takes precedence;}) electric circuit arrangements <a href="#">H01H 47/00</a>; details of electrically-operated selector switches <a href="#">H01H 63/00</a>)</b>                  | 50/28    | . . . . Parts movable due to bending of a blade spring or reed   |
| 50/002   | . {particular to three-phase electromagnetic relays (synchronous switching <a href="#">H01H 9/563</a> )}  |          |  |



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| 50/30    | . . . Mechanical arrangements for preventing or damping vibration or shock, e.g. by balancing of armature   | 50/641 | . . {intermediate part performing a rectilinear movement ( <a href="#">H01H 50/645</a> , <a href="#">H01H 50/66</a> - <a href="#">H01H 50/74</a> take precedence)}  |
| 50/305   | . . . . {damping vibration due to functional movement of armature (in air-gap <a href="#">H01H 50/163</a> )}  | 50/642 | . . . {intermediate part being generally a slide plate, e.g. a card}  |
| 50/32    | . . . Latching movable parts mechanically   | 50/643 | . . {intermediate part performing a rotating or pivoting movement ( <a href="#">H01H 50/645</a> , <a href="#">H01H 50/66</a> - <a href="#">H01H 50/74</a> take precedence)}   |
| 50/321   | . . . . {the mechanical latch being controlled directly by the magnetic flux or part of it}   | 50/644 | . . . {having more than one rotating or pivoting part}  |
| 50/323   | . . . . {for interlocking two or more relays}   | 50/645 | . . {intermediate part making a resilient or flexible connection ( <a href="#">H01H 50/66</a> - <a href="#">H01H 50/74</a> take precedence)}  |
| 2050/325 | . . . . . {Combined electrical and mechanical interlocking, e.g. usually for auxiliary contacts}  | 50/646 | . . . {intermediate part being a blade spring}  |
| 50/326   | . . . . . {with manual intervention, e.g. for testing, resetting or mode selection}   | 50/647 | . . {intermediate part comprising interlocking means for different contact pairs ( <a href="#">H01H 50/66</a> - <a href="#">H01H 50/74</a> take precedence; for two separate relays <a href="#">H01H 50/323</a> ; for ratchets <a href="#">H01H 51/08</a> )}  |
| 2050/328 | . . . . . {with manual locking means having three positions, e.g. on-off-automatic}   | 50/648 | . . {intermediate part being rigidly combined with armature ( <a href="#">H01H 50/66</a> - <a href="#">H01H 50/74</a> take precedence)}   |
| 50/34    | . . . Means for adjusting limits of movement; Mechanical means for adjusting returning force  | 50/66  | . . with lost motion  |
| 50/36    | . . Stationary parts of magnetic circuit, e.g. yoke   | 50/68  | . . with snap action  |
| 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}                         | 50/70  | . . operating contact momentarily during stroke of armature   |
| 2050/365 | . . . {formed from a single sheet of magnetic material by punching, bending, plying}  | 50/72  | . . for mercury contact   |
| 2050/367 | . . . {Methods for joining separate core and L-shaped yoke}   | 50/74  | . . Mechanical means for producing a desired natural frequency of operation of the contacts, e.g. for self-interrupter  |
| 50/38    | . . . Part of main magnetic circuit shaped to suppress arcing between the contacts of the relay   | 50/76  | . . . using reed or blade spring  |
| 50/40    | . . . Branched or multiple-limb main magnetic circuits  | 50/78  | . . . using diaphragm; using stretched wire or ribbon vibrating sideways  |
| 50/42    | . . . Auxiliary magnetic circuits, e.g. for maintaining armature in, or returning armature to, position of rest, for damping or accelerating movement                       | 50/80  | . . . using torsionally-vibrating member, e.g. wire, strip  |
| 50/44    | . Magnetic coils or windings  | 50/82  | . . . using spring-loaded pivoted inertia member  |
| 50/443   | . . {Connections to coils}  | 50/84  | . . . with means for adjustment of frequency or of make-to-break ratio  |
| 2050/446 | . . {Details of the insulating support of the coil, e.g. spool, bobbin, former}   | 50/86  | . Means for introducing a predetermined time delay between the initiation of the switching operation and the opening or closing of the contacts ( <a href="#">circuit arrangements for introducing delay <a href="#">H01H 47/18</a>; short-circuited conducting sleeves, bands, or discs <a href="#">H01H 50/46</a></a> ) |
| 50/46    | . . Short-circuited conducting sleeves, bands, or discs {(for electromagnets <a href="#">H01F 7/1205</a> )}   | 50/88  | . . Mechanical means, e.g. dash-pot   |
| 50/54    | . Contact arrangements  | 50/90  | . . . the delay effective in both directions of operation   |
| 50/541   | . . {Auxiliary contact devices}   | 50/92  | . . Thermal means ( <a href="#">inherent in electrothermal relays <a href="#">H01H 61/00</a></a> )  |
| 50/543   | . . . {Auxiliary switch inserting resistor during closure of contactor}   | 51/00  | <b>Electromagnetic relays (relays using the dynamo-electric effect <a href="#">H01H 53/00</a>)</b>  |
| 50/545   | . . . {Self-contained, easily replaceable microswitches}  | 51/005 | . . {Inversing contactors ( <a href="#">H01H 50/323</a> takes precedence)}  |
| 50/546   | . . {for contactors having bridging contacts}   | 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 {( <a href="#">H01H 51/02</a> - <a href="#">H01H 51/26</a> take precedence)}  |
| 50/548   | . . {for miniaturised relays}   | 51/02  | . Non-polarised relays  |
| 50/56    | . . Contact spring sets   | 51/04  | . . with single armature; with single set of ganged armatures   |
| 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 <a href="#">H01H 51/2254</a> , <a href="#">H01H 51/2281</a> )}       |        |   |
| 50/62    | . . Co-operating movable contacts operated by separate electrical actuating means   |        |   |
| 50/64    | . Driving arrangements between movable part of magnetic circuit and contact ( <a href="#">structurally associated with contact spring sets <a href="#">H01H 50/58</a></a> ) |        |   |

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| 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 | 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 ( <a href="#">H01H 51/27 takes precedence</a> )    |
| 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 ( <a href="#">details H01H 50/20</a> )}  | 51/281       | . . {Mounting of the relay; Encapsulating; Details of connections}   |
| 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   | 51/282       | . . {Constructional details not covered by <a href="#">H01H 51/281</a> }   |
| 51/082    | . . . . . {using rotating ratchet mechanism}   | 51/284       | . . {Polarised relays}   |
| 51/084    | . . . . . {with axial ratchet elements}  | 51/285       | . . . {for latching of contacts}   |
| 51/086    | . . . . . {with radial ratchet elements}   | 51/287       | . . {Details of the shape of the contact springs}  |
| 51/088    | . . . . . {moved alternately in opposite directions}   | 51/288       | . . {Freely suspended contacts}  |
| 51/10     | . . . . Contacts retained open or closed by a latch which is controlled by an electromagnet  | 51/29        | . Relays having armature, contacts, and operating coil within a sealed casing ( <a href="#">H01H 51/27 takes precedence</a> )  |
| 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  | 51/30        | . specially adapted for actuation by AC  |
| 51/14     | . . . . without intermediate neutral position of rest  | 51/32        | . . Frequency relays; Mechanically-tuned relays  |
| 51/16     | . . . . with intermediate neutral position of rest   | 51/34        | . Self-interrupters, i.e. with periodic or other repetitive opening and closing of contacts  |
| 51/18     | . . . Armature is rotatable through an unlimited number of revolutions   | 51/36        | . . wherein the make-to-break ratio is varied by hand setting or current strength  |
| 51/20     | . . with two or more independent armatures   | <b>53/00</b> | <b>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</b> |
| 51/22     | . Polarised relays ( <a href="#">H01H 51/284 takes precedence</a> )  | 53/01        | . Details  |
| 51/2209   | . . {with rectilinearly movable armature}  | 53/015       | . . Moving coils; Contact-driving arrangements associated therewith  |
| 2051/2218 | . . . {having at least one movable permanent magnet}   | 53/02        | . Electrodynamic relays, i.e. relays in which the interaction is between two current-carrying conductors   |
| 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 ( <a href="#">H01H 51/2209 takes precedence</a> )}  | 53/04        | . . Ferrodynamic relays, i.e. relays in which the magnetic field is concentrated in ferromagnetic parts  |
| 51/2236   | . . {comprising pivotable armature, pivoting at extremity or bending point of armature ( <a href="#">H01H 51/2227 takes precedence</a> )}  | 53/06        | . Magnetodynamic relays, i.e. relays in which the magnetic field is produced by a permanent magnet   |
| 51/2245   | . . . {Armature inside coil}   | 53/08        | . wherein a mercury contact constitutes the current-carrying conductor   |
| 51/2254   | . . . . {Contact forms part of armature}   | 53/10        | . Induction relays, i.e. relays in which the interaction is between a magnetic field and current induced thereby in a conductor  |
| 51/2263   | . . {comprising rotatable armature, rotating around central axis perpendicular to the main plane of the armature ( <a href="#">H01H 51/2227 takes precedence</a> )}  | 53/12        | . . Ferraris relays  |
| 51/2272   | . . {comprising rockable armature, rocking movement around central axis parallel to the main plane of the armature ( <a href="#">H01H 51/2227 takes precedence</a> )}  | 53/14        | . Contacts actuated by an electric motor through fluid-pressure transmission, e.g. using a motor-driven pump   |
| 51/2281   | . . . {Contacts rigidly combined with armature}  | <b>55/00</b> | <b>Magnetostrictive relays</b>   |
| 51/229    | . . . . {Blade-spring contacts alongside armature}   | <b>57/00</b> | <b>Electrostrictive relays; Piezoelectric relays</b>   |
| 51/24     | . . without intermediate neutral position of rest  | 2057/003     | . {the relay being latched in actuated position by magnet}   |
| 51/26     | . . with intermediate neutral position of rest   | 2057/006     | . {Micromechanical piezoelectric relay}  |
| 51/27     | . Relays with armature having two stable magnetic states and operated by change from one state to the other  | <b>59/00</b> | <b>Electrostatic relays; Electro-adhesion relays</b>   |
|           |  | 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}   |

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| 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}  | 63/20        | . . . using stepping magnet and ratchet   |
| 2059/0054        | . . {Rocking contacts or actuating members}  | 63/22        | . . . using step-by-step electromagnetic drive without ratchet, e.g. self-interrupting driving magnet   |
| 2059/0063        | . . {with stepped actuation, e.g. actuation voltages applied to different sets of electrodes at different times or different spring constants during actuation}  | 63/24        | . . with continuous motion of wiper until a selected position is reached  |
| 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}                                     | 63/26        | . . . with an individual clutch-drive from a shaft common to more than one selector switch  |
| 2059/0081        | . . {with a tapered air-gap between fixed and movable electrodes}  | 63/28        | . . . with an individual motor for each selector switch   |
| 2059/009         | . {using permanently polarised dielectric layers}  | 63/30        | . . . . Pneumatic motor for moving wiper to selected position   |
| <b>61/00</b>     | <b>Electrothermal relays (thermal switches not operated by electrical input, thermal switches with anticipating electrical input <a href="#">H01H 37/00</a>; thermally-sensitive members <a href="#">H01H 37/32</a>)</b> | 63/32        | . . . . Spring motor for moving wiper to selected position  |
| 61/002           | . {Structural combination of a time delay electrothermal relay with an electrothermal protective relay, e.g. a start relay}  | 63/33        | . Constructional details of co-ordinate-type selector switches not having relays at cross-points  |
| 2061/004         | . . {PTC resistor in series with start winding, e.g. adapted for being switched off after starting for limiting power dissipation}   | 63/34        | . Bases; Cases; Covers; Mountings ( <a href="#">racks for mounting selectors with or without other exchange equipment <a href="#">H04Q 1/04</a></a> ); Mounting of fuses on selector switch |
| 2061/006         | . {Micromechanical thermal relay}  | 63/36        | . Circuit arrangements for ensuring correct or desired operation and not adapted to a particular application of the selector switch   |
| 2061/008         | . . {Micromechanical actuator with a cold and a hot arm, coupled together at one end}  | 63/38        | . . for multi-position wiper switches   |
| 61/01            | . Details  | 63/40        | . . for multi-position switches without wipers  |
| 61/0107          | . . {making use of shape memory materials}   | 63/42        | . . . for co-ordinate-type selector switches not having relays at cross-points  |
| 2061/0115        | . . . {Shape memory alloy [SMA] actuator formed by coil spring}  | <b>65/00</b> | <b>Apparatus or processes specially adapted to the manufacture of selector switches or parts thereof</b>  |
| 2061/0122        | . . . {Two SMA actuators, e.g. one for closing or resetting contacts and one for opening them}   | <b>67/00</b> | <b>Electrically-operated selector switches</b>  |
| 61/013           | . . Heating arrangements for operating relays  | 67/02        | . Multi-position wiper switches   |
| 61/017           | . . . Heating by glow discharge or arc in confined space   | 67/04        | . . having wipers movable only in one direction for purpose of selection  |
| 61/02            | . wherein the thermally-sensitive member is heated indirectly, e.g. resistively, inductively   | 67/06        | . . . Rotary switches, i.e. having angularly movable wipers   |
| 61/04            | . wherein the thermally-sensitive member is only heated directly   | 67/08        | . . . . with wiper selection  |
| 61/06            | . Self-interrupters, i.e. with periodic or other repetitive opening and closing of contacts  | 67/10        | . . . . with coarse and fine positioning of wipers  |
| 61/063           | . . {making use of a bimetallic element}   | 67/12        | . . . Linear-motion switches  |
| 61/066           | . . {making use of an extensible wire, rod or strips}  | 67/14        | . . having wipers movable in two mutually perpendicular directions for purpose of selection   |
| 61/08            | . . wherein the make-to-break ratio is varied by hand setting or current strength  | 67/16        | . . . one motion being rotary and the other being parallel to the axis of rotation, e.g. Strowger or "up and around" switches   |
| <b>Selectors</b> |  | 67/18        | . . . one motion being rotary and the other being perpendicular to the axis of rotation, e.g. "round and in" switches   |
| <b>63/00</b>     | <b>Details of electrically-operated selector switches</b>  | 67/20        | . . . both motions being linear   |
| 63/02            | . Contacts; Wipers; Connections thereto  | 67/22        | . Switches without multi-position wipers  |
| 63/04            | . . Contact-making or contact-breaking wipers; Position indicators therefor  | 67/24        | . . Co-ordinate-type relay switches having an individual electromagnet at each cross-point  |
| 63/06            | . . Contact banks  | 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  |
| 63/08            | . . . cylindrical  | 67/30        | . . Co-ordinate-type selector switches with field of co-ordinate coil acting directly upon magnetic leaf spring or reed-type contact member   |
| 63/10            | . . . plane  | 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                      |
| 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   |              |   |

**Emergency protective devices**

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| <b>69/00</b> | <b>Apparatus or processes for the manufacture of emergency protective devices</b>  |  |
| 69/01        | . for calibrating or setting of devices to function under predetermined conditions   |  |
| 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}  |  |
| <b>71/00</b> | <b>Details of the protective switches or relays covered by groups <a href="#">H01H 73/00</a> - <a href="#">H01H 83/00</a></b>  |  |
| 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 phase 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 ( <a href="#">H01H 71/0221</a> 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 ( <a href="#">cassettes for rotating bridges see <a href="#">H01H 1/2058</a></a> )}                                   |  |
| 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 ( <a href="#">interconnected mechanisms <a href="#">H01H 71/1009</a></a> )}   |  |
| 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 <a href="#">H01H 71/46</a> )}  |  |
| 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   |  |
| 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 ( <a href="#">H01H 71/1045</a> takes precedence; operated by excess current and other electrical conditions <a href="#">H01H 83/20</a> )}   |  |
| 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 ( <a href="#">circuits <a href="#">H02H 3/06</a>, <a href="#">H02H 7/26</a></a> )}   |  |
| 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 ( <a href="#">with auxiliary contact <a href="#">H01H 71/48</a></a> )}   |  |
| 71/122       | . . . {actuated by blowing of a fuse}  |  |
| 71/123       | . . . {using a solid-state trip unit ( <a href="#">circuits <a href="#">H02H</a></a> )}  |  |
| 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 ( <a href="#">for differential protection <a href="#">H01H 83/144</a></a> )}   |  |
| 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 ( <a href="#">two similar push buttons for closing or resetting and opening or tripping <a href="#">H01H 71/58</a></a> ; test switches for earth fault circuit breakers <a href="#">H01H 83/04</a> )} |  |



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| 71/14     | . . .     | Electrothermal mechanisms {(combined with a electro-thermal time delay relay <a href="#">H01H 61/002</a> )}  | 71/325   | . . . . . | {Housings, assembly or disposition of different elements in the housing}   |
| 71/142    | . . . .   | {actuated due to change of magnetic permeability}  | 71/326   | . . . . . | {Sealed housings}  |
| 71/145    | . . . .   | {using shape memory materials ( <a href="#">H01H 71/16</a> takes precedence)}  | 71/327   | . . . . . | {Manufacturing or calibrating methods, e.g. air gap treatments}  |
| 2071/147  | . . . .   | {Thermal release by expansion of a fluid}  | 2071/328 | . . . . . | {using a spring for having minimal force on armature while maximal force on trip pin}  |
| 71/16     | . . . .   | with bimetal element {(combined with detection of imbalance of two or more currents <a href="#">H01H 83/223</a> )}   | 71/34    | . . . .   | having two or more armatures controlled by a common winding  |
| 71/161    | . . . . . | {with helically or spirally wound bimetal}   | 71/345   | . . . . . | {having a delayed movable core and a movable armature}   |
| 71/162    | . . . . . | {with compensation for ambient temperature}  | 71/36    | . . . .   | frequency selective  |
| 71/164    | . . . . . | {Heating elements}   | 71/38    | . . . .   | wherein the magnet coil also acts as arc blow-out device   |
| 2071/165  | . . . . . | {the bimetal being inductively heated, e.g. load current does not pass through bimetal}  | 71/40    | . . .     | Combined electrothermal and electromagnetic mechanisms   |
| 2071/167  | . . . . . | {Multiple bimetals working in parallel together, e.g. laminated together}  | 71/402   | . . . .   | {in which the thermal mechanism influences the magnetic circuit of the electromagnetic mechanism}  |
| 2071/168  | . . . . . | {Provisions for avoiding permanent deformation and thus decalibration of bimetal, e.g. due to overheating or action of a magnet}   | 71/405   | . . . .   | {in which a bimetal forms the inductor for the electromagnetic mechanism}  |
| 71/18     | . . . .   | with expanding rod, strip, or wire   | 2071/407 | . . . .   | {the thermal element being heated by the coil of the electromagnetic mechanism}  |
| 71/20     | . . . .   | with fusible mass  | 71/42    | . . .     | Induction-motor, induced-current, or electrodynamic release mechanisms   |
| 71/205    | . . . . . | {using a ratchet wheel kept against rotation by solder}  | 71/43    | . . . .   | Electrodynamic release mechanisms  |
| 71/22     | . . . .   | with compensation for variation of ambient temperature {( <a href="#">H01H 71/162</a> takes precedence)}   | 71/44    | . . .     | having means for introducing a predetermined time delay (by short-circuited winding <a href="#">H01H 71/30</a> ; by additional armature <a href="#">H01H 71/34</a> ) |
| 71/24     | . . .     | Electromagnetic mechanisms   | 71/443   | . . . .   | {with dash-pot}  |
| 71/2409   | . . . .   | {combined with an electromagnetic current limiting mechanism}  | 71/446   | . . . .   | {making use of an inertia mass}  |
| 71/2418   | . . . .   | {combined with an electrodynamic current limiting mechanism}   | 71/46    | . . .     | having means for operating auxiliary contacts additional to the main contacts  |
| 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}         | 71/462   | . . . .   | {housed in a separate casing, juxtaposed to and having the same general contour as the main casing (for neutral conductor <a href="#">H01H 71/002</a> )}             |
| 71/2436   | . . . .   | {with a holding and a releasing magnet, the holding force being limited due to saturation of the holding magnet}   | 71/465   | . . . .   | {Self-contained, easily replaceable microswitches}   |
| 71/2445   | . . . .   | {using a reed switch (for current measuring <a href="#">G01R 19/16509</a> )}   | 2071/467 | . . . .   | {with history indication, e.g. of trip and/or kind of trip, number of short circuits etc.}   |
| 71/2454   | . . . .   | {characterised by the magnetic circuit or active magnetic elements}  | 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                   |
| 71/2463   | . . . .   | {with plunger type armatures}  | 71/50    | . .       | Manual reset mechanisms {which may be also used for manual release}  |
| 71/2472   | . . . .   | {with rotatable armatures}   | 71/501   | . . .     | {Means for breaking welded contacts; Indicating contact welding or other malfunction of the circuit breaker}   |
| 71/2481   | . . . .   | {characterised by the coil design}   | 2071/502 | . . . .   | {with direct contact between manual operator and welded contact structure}   |
| 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} | 71/503   | . . .     | {Means for increasing the opening stroke of the contacts}  |
| 71/26     | . . . .   | with windings acting in opposition {( <a href="#">H01H 71/2436</a> takes precedence)}  | 71/504   | . . .     | {provided with anti-rebound means}   |
| 71/28     | . . . .   | with windings acting in conjunction  | 71/505   | . . .     | {Latching devices between operating and release mechanism}   |
| 71/30     | . . . .   | having additional short-circuited winding  | 2071/506 | . . . .   | {using balls or rollers in the latching device}  |
| 71/32     | . . . .   | having permanently magnetised part   | 2071/507 | . . . .   | {being collapsible, e.g. yielding elastically, when the opening force is higher than a predetermined value}  |
| 71/321    | . . . . . | {characterised by the magnetic circuit or active magnetic elements}  |          |           |  |
| 71/322    | . . . . . | {with plunger type armature}   |          |           |  |
| 71/323    | . . . . . | {with rotatable armature}  |          |           |  |

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| 2071/508  | . . . . {with serial latches, e.g. primary latch latched by secondary latch for requiring a smaller trip force}  | 2071/7472    | . . {with antitamper means for avoiding unauthorised setting}  |
| 71/52     | . . . actuated by lever  | 2071/7481    | . . {with indexing means for magnetic or thermal tripping adjustment knob}   |
| 71/521    | . . . . {Details concerning the lever handle}  | 2071/749     | . . {with a shunt element connected in parallel to magnetic or thermal trip elements, e.g. for adjusting trip current}   |
| 71/522    | . . . . {comprising a cradle-mechanism}  |              |  |
| 71/523    | . . . . . {the contact arm being pivoted on cradle and mechanism spring acting between handle and contact arm}   | <b>73/00</b> | <b>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</b> |
| 71/524    | . . . . . {the contact arm being pivoted on handle and mechanism spring acting between cradle and contact arm}   | . Details    |  |
| 71/525    | . . . . . {comprising a toggle between cradle and contact arm and mechanism spring acting between handle and toggle knee}  | . . Contacts |  |
| 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}                                       | 73/02        |  |
| 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} | 73/04        |  |
| 71/528    | . . . . . {comprising a toggle or collapsible link between handle and contact arm, e.g. sear pin mechanism}  | 73/045       | . . . {Bridging contacts}  |
| 71/529    | . . . . . {comprising an electroresponsive element forming part of the transmission chain between handle and contact arm}  | 73/06        | . . Housings; Casings; Bases; Mountings  |
| 71/54     | . . . actuated by tumbler  | 73/08        | . . . Plug-in housings   |
| 71/56     | . . . actuated by rotatable knob or wheel  | 73/10        | . . . Cartridge housings, e.g. screw-in housing  |
| 2071/565  | . . . . {using a add on unit, e.g. a separate rotary actuator unit, mounted on lever actuated circuit breakers}  | 73/12        | . . Means for indicating condition of the switch   |
| 71/58     | . . . actuated by push-button, pull-knob, or slide   | 73/14        | . . . Indicating lamp structurally associated with the switch  |
| 71/60     | . . . actuated by closure of switch casing   | 73/16        | . . Distinguishing marks, e.g. colour coding   |
| 71/62     | . . . with means for preventing resetting while abnormal condition persists, e.g. loose handle arrangement   | 73/18        | . . Means for extinguishing or suppressing arc<br>(magnet coil acting as blow-out device <a href="#">H01H 71/38</a> )  |
| 71/64     | . . . . incorporating toggle linkage   | 73/20        | . . Terminals; Connections   |
| 71/66     | . . Power reset mechanisms   | 73/22        | . having electrothermal release and no other automatic release (cartridge type <a href="#">H01H 73/62</a> )  |
| 2071/665  | . . . {the reset mechanism operating directly on the normal manual operator, e.g. electromagnet pushes manual release lever back into "ON" position}   | 73/24        | . . reset by lever   |
| 71/68     | . . . actuated by electromagnet  | 73/26        | . . reset by tumbler   |
| 71/685    | . . . . {in which the excitation of the electromagnet is interrupted by abnormal conditions}   | 73/28        | . . reset by rotatable knob or wheel   |
| 71/70     | . . . actuated by electric motor   | 73/30        | . . reset by push-button, pull-knob or slide   |
| 71/72     | . . . actuated automatically a limited number of times   | 73/303       | . . . {with an insulating body insertable between the contacts when released by a bimetal element}   |
| 71/74     | . Means for adjusting the conditions under which the device will function to provide protection  | 73/306       | . . . {the push-button supporting pivotally a combined contact-latch lever}  |
| 71/7409   | . . {Interchangeable elements}   | 73/32        | . . reset by closure of switch casing  |
| 71/7418   | . . {Adjusting both electrothermal and electromagnetic mechanism}  | 73/34        | . . reset action requiring replacement or reconditioning of a fusible or explosive part  |
| 71/7427   | . . {Adjusting only the electrothermal mechanism}  | 73/36        | . having electromagnetic release and no other automatic release (cartridge type <a href="#">H01H 73/64</a> )   |
| 71/7436   | . . . {Adjusting the position (or prestrain) of the bimetal ( <a href="#">H01H 71/7445</a> takes precedence)}  | 73/38        | . . reset by lever   |
| 71/7445   | . . . {Poly-phase adjustment}  | 73/40        | . . reset by tumbler   |
| 2071/7454 | . . . {with adjustable axis of transmission lever between bimetal element and trip lever}  | 73/42        | . . reset by rotatable knob or wheel   |
| 71/7463   | . . {Adjusting only the electromagnetic mechanism}   | 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 <a href="#">H01H 73/66</a> )  |
|           |  | 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   |
|           |  | <b>75/00</b> | <b>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</b>  |
|           |  | . Details    |  |
|           |  | 75/02        |  |

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| 75/04        | <ul style="list-style-type: none"> <li>Reset mechanisms for automatically reclosing a limited number of times (<a href="#">circuit arrangements H02H 3/06</a>)</li> </ul>                            | 83/12        | <ul style="list-style-type: none"> <li>operated by voltage falling below a predetermined value, e.g. for no-volt protection</li> </ul>   |
| 75/06        | <ul style="list-style-type: none"> <li>effecting one reclosing action only</li> </ul>  | 83/14        | <ul style="list-style-type: none"> <li>operated by imbalance of two or more currents or voltages, e.g. for differential protection</li> </ul>  |
| 75/08        | <ul style="list-style-type: none"> <li>having only electrothermal release</li> </ul>   | 83/142       | <ul style="list-style-type: none"> <li>{with bimetal elements}</li> </ul>  |
| 75/10        | <ul style="list-style-type: none"> <li>having only electromagnetic release</li> </ul>  | 83/144       | <ul style="list-style-type: none"> <li>{with differential transformer}</li> </ul>  |
| 75/12        | <ul style="list-style-type: none"> <li>having combined electrothermal and electromagnetic release</li> </ul>   | 2083/146     | <ul style="list-style-type: none"> <li>{Provisions for avoiding disadvantages of having asymmetrical primaries, e.g. induction of a magnetic field even by zero difference current}</li> </ul>   |
| <b>77/00</b> | <b>Protective overload circuit-breaking switches operated by excess current and requiring separate action for resetting (<a href="#">H01H 73/00</a>, <a href="#">H01H 75/00</a> take precedence)</b> | 2083/148     | <ul style="list-style-type: none"> <li>{with primary windings formed of rigid copper conductors}</li> </ul>  |
| 77/02        | <ul style="list-style-type: none"> <li>in which the excess current itself provides the energy for opening the contacts, and having a separate reset mechanism</li> </ul>                             | 83/16        | <ul style="list-style-type: none"> <li>operated by abnormal ratio of voltage and current, e.g. distance relay</li> </ul>   |
| 2077/025     | <ul style="list-style-type: none"> <li>{with pneumatic means, e.g. by arc pressure}</li> </ul>   | 83/18        | <ul style="list-style-type: none"> <li>operated by abnormal product of, or abnormal phase angle between, voltage and current, e.g. directional relay</li> </ul>  |
| 77/04        | <ul style="list-style-type: none"> <li>with electrothermal opening</li> </ul>  | 83/20        | <ul style="list-style-type: none"> <li>operated by excess current as well as by some other abnormal electrical condition</li> </ul>  |
| 77/06        | <ul style="list-style-type: none"> <li>with electromagnetic opening {(combined with electromagnetic release mechanism <a href="#">H01H 71/2409</a>)}</li> </ul>                                      | 2083/201     | <ul style="list-style-type: none"> <li>{the other abnormal electrical condition being an arc fault}</li> </ul>   |
| 77/08        | <ul style="list-style-type: none"> <li>retained closed by permanent or remanent magnetism and opened by windings acting in opposition</li> </ul>   | 2083/203     | <ul style="list-style-type: none"> <li>{with shunt trip circuits, e.g. NC contact in an undervoltage coil circuit}</li> </ul>  |
| 77/10        | <ul style="list-style-type: none"> <li>with electrodynamic opening {(combined with electromagnetic release mechanism <a href="#">H01H 71/2418</a>)}</li> </ul>                                       | 2083/205     | <ul style="list-style-type: none"> <li>{having shunt or UVR tripping device with integrated mechanical energy accumulator}</li> </ul>  |
| 77/101       | <ul style="list-style-type: none"> <li>{with increasing of contact pressure by electrodynamic forces before opening}</li> </ul>  | 2083/206     | <ul style="list-style-type: none"> <li>{with thermal shunt trip}</li> </ul>  |
| 77/102       | <ul style="list-style-type: none"> <li>{characterised by special mounting of contact arm, allowing blow-off movement}</li> </ul>   | 2083/208     | <ul style="list-style-type: none"> <li>{Converting under voltage release [UVR] and shunt release}</li> </ul>   |
| 77/104       | <ul style="list-style-type: none"> <li>{with a stable blow-off position}</li> </ul>  | 83/22        | <ul style="list-style-type: none"> <li>the other condition being imbalance of two or more currents or voltages</li> </ul>  |
| 77/105       | <ul style="list-style-type: none"> <li>{whereby the blow-off movement unlatches the contact from a contact holder}</li> </ul>  | 83/223       | <ul style="list-style-type: none"> <li>{with bimetal elements}</li> </ul>  |
| 77/107       | <ul style="list-style-type: none"> <li>{characterised by the blow-off force generating means, e.g. current loops}</li> </ul>   | 83/226       | <ul style="list-style-type: none"> <li>{with differential transformer}</li> </ul>  |
| 77/108       | <ul style="list-style-type: none"> <li>{comprising magnetisable elements, e.g. flux concentrator, linear slot motor}</li> </ul>  | <b>85/00</b> | <b>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 (<a href="#">switches actuated by melting of fusible material H01H 37/76</a>; disposition or arrangement of fuses on boards <a href="#">H02B 1/18</a>)</b> |
| <b>79/00</b> | <b>Protective switches in which excess current causes the closing of contacts, e.g. for short-circuiting the apparatus to be protected (<a href="#">H01H 39/004</a> takes precedence)</b>            | 2085/0004    | <ul style="list-style-type: none"> <li>{making use of shape-memory material}</li> </ul>  |
| <b>81/00</b> | <b>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</b>            | 2085/0008    | <ul style="list-style-type: none"> <li>{making use of heat shrinkable material}</li> </ul>   |
| 81/02        | <ul style="list-style-type: none"> <li>electrothermally operated</li> </ul>  | 85/0013      | <ul style="list-style-type: none"> <li>{Means for preventing damage, e.g. by ambient influences to the fuse}</li> </ul>  |
| 81/04        | <ul style="list-style-type: none"> <li>electromagnetically operated</li> </ul>   | 85/0017      | <ul style="list-style-type: none"> <li>{due to vibration or other mechanical forces, e.g. centrifugal forces}</li> </ul>   |
| <b>83/00</b> | <b>Protective switches, e.g. circuit-breaking switches, or protective relays operated by abnormal electrical conditions otherwise than solely by excess current</b>                                  | 85/0021      | <ul style="list-style-type: none"> <li>{water or dustproof devices}</li> </ul>   |
| 83/02        | <ul style="list-style-type: none"> <li>operated by earth fault currents (<a href="#">H01H 83/14</a> takes precedence)</li> </ul>   | 85/0026      | <ul style="list-style-type: none"> <li>{casings for the fuse and its base contacts}</li> </ul>   |
| 83/04        | <ul style="list-style-type: none"> <li>with testing means for indicating the ability of the switch or relay to function properly</li> </ul>  | 85/003       | <ul style="list-style-type: none"> <li>{casings for the fusible element}</li> </ul>  |
| 2083/045     | <ul style="list-style-type: none"> <li>{Auxiliary switch opening testing circuit in synchronism with the main circuit}</li> </ul>  | 2085/0034    | <ul style="list-style-type: none"> <li>{with molded casings}</li> </ul>  |
| 83/06        | <ul style="list-style-type: none"> <li>operated by current falling below a predetermined value</li> </ul>  | 85/0039      | <ul style="list-style-type: none"> <li>{Means for influencing the rupture process of the fusible element}</li> </ul>   |
| 83/08        | <ul style="list-style-type: none"> <li>operated by reversal of DC</li> </ul>   | 85/0043      | <ul style="list-style-type: none"> <li>{Boiling of a material associated with the fusible element, e.g. surrounding fluid}</li> </ul>  |
| 83/10        | <ul style="list-style-type: none"> <li>operated by excess voltage, e.g. for lightning protection</li> </ul>  | 85/0047      | <ul style="list-style-type: none"> <li>{Heating means}</li> </ul>  |
|              |  | 85/0052      | <ul style="list-style-type: none"> <li>{Fusible element and series heating means or series heat dams}</li> </ul>   |
|              |  | 85/0056      | <ul style="list-style-type: none"> <li>{Heat conducting or heat absorbing means associated with the fusible member, e.g. for providing time delay}</li> </ul>  |
|              |  | 85/006       | <ul style="list-style-type: none"> <li>{Heat reflective or insulating layer on the casing or on the fuse support}</li> </ul>   |
|              |  | 85/0065      | <ul style="list-style-type: none"> <li>{Heat reflective or insulating layer on the fusible element}</li> </ul>   |

|           |   |           |  |
|-----------|---|-----------|--|
| 85/0069   | . . . {Heat reflective or insulating filler, support, or block forming the casing}  | 85/048    | . . . . Fuse resistors   |
| 85/0073   | . . {Expansion or rupture of the insulating support for the fusible element}  | 2085/0483 | . . . . {with temperature dependent resistor, e.g. thermistor}   |
| 85/0078   | . {Security-related arrangements}   | 2085/0486 | . . . . {with voltage dependent resistor, e.g. varistor}   |
| 85/0082   | . . {preventing explosion of the cartridge}   | 85/05     | . . . Component parts thereof  |
| 85/0086   | . . . {use of a flexible body, e.g. inside the casing}  | 85/055    | . . . . Fusible members  |
| 85/0091   | . . {providing disconnection of the neutral line}   | 2085/0555 | . . . . {Input terminal connected to a plurality of output terminals, e.g. multielectrode}   |
| 85/0095   | . . {Earthing means}  | 85/06     | . . . . characterised by the fusible material<br>(H01H 85/11 takes precedence)   |
| 85/02     | . Details   | 85/08     | . . . . characterised by the shape or form of the fusible member   |
| 85/0208   | . . {Tools for inserting and removing fuses}  | 85/10     | . . . . with constriction for localised fusing<br>(H01H 85/11 takes precedence)  |
| 2085/0216 | . . {Tools for controlling fuses or the line associated with the fuses}   | 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 |
| 2085/0225 | . . {Means for preventing discharge, e.g. corona ring}  | 85/12     | . . . . Two or more separate fusible members in parallel   |
| 2085/0233 | . . {with common casing for fusible elements inserted in more than one phase or more than one circuit}  | 85/143    | . . . . Electrical contacts; Fastening fusible members to such contacts  |
| 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 H10W 20/493 or H10W 42/80)} | 85/147    | . . . . Parallel-side contacts   |
| 2085/025  | . . . {Structural association with a binding post of a storage battery}   | 85/15     | . . . . Screw-in contacts  |
| 2085/0258 | . . . {Structural association of a fuse or a fuse holder with a bimetallic element}   | 85/153    | . . . . Knife-blade-end contacts   |
| 2085/0266 | . . . {Structural association with a measurement device, e.g. a shunt}  | 85/157    | . . . . Ferrule-end contacts   |
| 2085/0275 | . . . {Structural association with a printed circuit board}   | 85/165    | . . . . Casings  |
| 2085/0283 | . . . {Structural association with a semiconductor device}  | 85/17     | . . . . characterised by the casing material   |
| 2085/0291 | . . . {Structural association with a current transformer}   | 85/175    | . . . . characterised by the casing shape or form  |
| 85/04     | . . Fuses, i.e. expendable parts of the protective device, e.g. cartridges  | 85/1755   | . . . . {composite casing}   |
| 85/041    | . . . characterised by the type   | 85/18     | . . . . Casing fillings, e.g. powder   |
| 85/0411   | . . . . {Miniature fuses}   | 85/185    | . . . . {Insulating members for supporting fusible elements inside a casing, e.g. for helically wound fusible elements}                            |
| 2085/0412 | . . . . {specially adapted for being mounted on a printed circuit board}  | 85/20     | . . Bases for supporting the fuse; Separate parts thereof  |
| 2085/0414 | . . . . {Surface mounted fuses}   | 85/2005   | . . . {for use with screw-in type fuse}  |
| 85/0415   | . . . . {cartridge type}  | 85/201    | . . . {for connecting a fuse in a lead and adapted to be supported by the lead alone}  |
| 85/0417   | . . . . {with parallel side contacts}   | 85/2015   | . . . {for plug-in type fuses}   |
| 85/0418   | . . . . {with ferrule type end contacts}  | 85/202    | . . . {for fuses with ferrule type end contacts}   |
| 85/042    | . . . . General constructions or structure of high voltage fuses, i.e. above 1000 V   | 85/2025   | . . . {for fuses with conical end contacts, e.g. fuses used on motor vehicles}   |
| 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)   | 85/203    | . . . {for fuses with blade type terminals}  |
| 85/0445   | . . . . fast or slow type<br>(H01H 85/045 - H01H 85/048 take precedence)  | 85/2035   | . . . . {for miniature fuses with parallel side contacts}  |
| 85/045    | . . . . cartridge type  | 85/204    | . . . . {for low voltage fuses with knife-blade end contacts}  |
| 85/0452   | . . . . {with parallel side contacts}   | 85/2045   | . . . {Mounting means or insulating parts of the base, e.g. covers, casings}   |
| 85/0454   | . . . . {with screw-in type contacts}   | 85/205    | . . . {Electric connections to contacts on the base}   |
| 85/0456   | . . . . {with knife-blade end contacts}   | 2085/0555 | . . . . {Connections to bus bars in an installation with screw in type fuses or knife blade fuses}   |
| 85/0458   | . . . . {with ferrule type end contacts}  | 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}        |
| 85/046    | . . . . Fuses formed as printed circuits  | 2085/2065 | . . . {with base contacts adapted or adaptable to fuses of different lengths; bases with self-aligning contacts; intermediate adaptation pieces}   |
| 85/047    | . . . . Vacuum fuses  |           |  |



|           |   |                |   |
|-----------|---|----------------|---|
| 2085/207  | . . . {Bases adapted to fuses with different end contacts or to other components, e.g. circuit breakers; intermediate adaptation pieces}                                    | 85/50          | . . the fuse having contacts at opposite ends for co-operation with the base  |
| 2085/2075 | . . . {Junction box, having holders integrated with several other holders in a particular wiring layout}  | 85/52          | . . the fuse being adapted for screwing into the base   |
| 2085/208  | . . . . {specially adapted for vehicles}  | 85/54          | . Protective devices wherein the fuse is carried, held, or retained by an intermediate or auxiliary part removable from the base, or used as sectionalisers   |
| 2085/2085 | . . . {Holders for mounting a fuse on a printed circuit}  | 85/542         | . . {the intermediate or auxiliary part being provided with bayonet-type locking means}   |
| 2085/209  | . . . {Modular assembly of fuses or holders, e.g. side by side; combination of a plurality of identical fuse units}   | 85/545         | . . {with pivoting fuse carrier (tumbler switch with built-in fuse <a href="#">H01H 23/10</a> )}  |
| 2085/2095 | . . . {Triangular setup of fuses, e.g. for space saving}  | 85/547         | . . {with sliding fuse carrier}   |
| 85/22     | . . Intermediate or auxiliary parts for carrying, holding, or retaining fuse, co-operating with base or fixed holder, and removable therefrom for renewing the fuse         | 85/56          | . . the intermediate or auxiliary part having side contacts for plugging into the base, e.g. bridge-carrier type  |
| 85/24     | . . Means for preventing insertion of incorrect fuse  | 85/58          | . . . with intermediate auxiliary part and base shaped to interfit and thereby enclose the fuse   |
| 85/25     | . . Safety arrangements preventing or inhibiting contact with live parts, including operation of isolation on removal of cover  | 85/60          | . . the intermediate or auxiliary part having contacts at opposite ends for co-operation with the base  |
| 85/26     | . . Magazine arrangements   | 85/62          | . . the intermediate or auxiliary part being adapted for screwing into the base   |
| 85/263    | . . . {with spare printed circuit fuse}   | <b>87/00</b>   | <b>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</b> |
| 2085/266  | . . . {with replacement of a fuse which is part of a printed circuit}   | <b>89/00</b>   | <b>Combinations of two or more different basic types of electric switches, relays, selectors and emergency protective devices, not covered by any single one of the other main groups of this subclass</b>  |
| 85/28     | . . . effecting automatic replacement   | 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, imbalance}  |
| 85/30     | . . Means for indicating condition of fuse structurally associated with the fuse  | 89/02          | . Combination of a key operated switch with a manually operated switch, e.g. ignition and lighting switches   |
| 85/303    | . . . {Movable indicating elements}   | 89/04          | . Combination of a thermally actuated switch with a manually operated switch  |
| 85/306    | . . . . {acting on an auxiliary switch or contact}  | 89/06          | . Combination of a manual reset circuit with a contactor, i.e. the same circuit controlled by both a protective and a remote control device   |
| 85/32     | . . . Indicating lamp structurally associated with the protective device  | 2089/065       | . . {Coordination between protection and remote control, e.g. protection job repartition, mutual assistance or monitoring}  |
| 85/34     | . . Distinguishing marks, e.g. colour coding  | 89/08          | . . with both devices using the same contact pair   |
| 85/36     | . . Means for applying mechanical tension to fusible member   | 89/10          | . . . with each device controlling one of the two co-operating contacts   |
| 85/38     | . . Means for extinguishing or suppressing arc (by powder filling <a href="#">H01H 85/18</a> ; by mechanical tension applied to fusible member <a href="#">H01H 85/36</a> ) |                |   |
| 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 <a href="#">H01H 33/22</a> )  |                |   |
| 85/42     | . . . using an arc-extinguishing gas (characterised by the composition of the gas <a href="#">H01H 33/22</a> )  |                |   |
| 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}   |                |   |
|           |   | <b>2201/00</b> | <b>Contacts</b>   |
|           |   | 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
- 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 . actuatable 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 . Collapsible 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; Program 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
- 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
- 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