

# CPC COOPERATIVE PATENT CLASSIFICATION

## H ELECTRICITY

(NOTE omitted)

## H01 BASIC ELECTRIC ELEMENTS

(NOTE omitted)

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

#### NOTES

1. Attention is drawn to the Notes following the titles of class [B81](#) and subclass [B81B](#) relating to "microstructural devices" and microstructural systems"
2. This subclass covers (in groups [H01H 69/00](#) - [H01H 87/00](#)) devices for the protection of electric lines or electric machines or apparatus in the event of undesired change from normal electric working conditions, the electrical condition serving directly as the input to the device.
3. This subclass does not cover bases, casings, or covers accommodating two or more switching devices or for accommodating a switching device as well as another electric component, e.g. bus-bar, line connector. Those bases, casings or covers are covered by group [H02B 1/26](#).
4. In this subclass, the following terms or expressions are used with the meanings indicated :
  - "relay" means a switching device having contacts which are operated from electric inputs which supply, directly or indirectly, all the mechanical energy necessary to cause both the closure and the opening of the contacts;
  - "driving mechanism" refers to the means by which an operating force applied to the switch is transmitted to the moving contact or contacts;
  - "operating" is used in a broader sense than "actuating" which is reserved for those parts not touched by hand to effect switching;
  - "acting" or "action" means a self-induced movement of parts at one stage of the switching.
 These connotations apply to all parts of the verbs "to operate", "to actuate" and "to act" and to words derived therefrom, e.g. to "actuation".
5. In this subclass, details are classified as follows :
  - details of an unspecified type of switching device, or disclosed as applicable to two or more kinds of switching devices designated by the terms or expressions "switches", "relays", "selector switches", and "emergency protective devices", are classified in groups [H01H 1/00](#) - [H01H 9/00](#);
  - details of an unspecified type of switch, or disclosed as applicable to two or more types of switches as defined by groups [H01H 13/00](#) - [H01H 43/00](#) and sub-groups [H01H 35/02](#), [H01H 35/06](#), [H01H 35/14](#), [H01H 35/18](#), [H01H 35/24](#) and [H01H 35/42](#), all hereinafter called basic types, are classified in groups [H01H 1/00](#) - [H01H 9/00](#);
  - details of an unspecified type of relay, or disclosed as applicable to two or more types of relays as defined by groups [H01H 51/00](#) - [H01H 61/00](#), hereinafter called basic types are classified in [H01H 45/00](#);
  - details of an unspecified protective device, or applicable to two or more types of protective devices as defined by groups [H01H 73/00](#) - [H01H 83/00](#), hereinafter called basic types, are classified in [H01H 71/00](#).
  - However, details only described with reference to, or clearly only applicable to, switching devices of a single basic type, are classified in the group appropriate to switching devices of that basic type, e.g. [H01H 19/02](#), [H01H 75/04](#);
  - mechanical structural details of control members of switches or of keyboards such as keys, push-buttons, levers or other mechanisms for transferring the force to the activated elements are classified in this subclass, even when they are used for controlling electronic switches.
 However, mechanical details directly producing electronic effects are classified in group [H03K 17/94](#).

#### WARNINGS

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

<a href="#">H01H 13/708</a> - <a href="#">H01H 13/718</a>	covered by	<a href="#">H01H 33/56</a>
<a href="#">H01H 33/575</a>	covered by	
<a href="#">H01H 33/65</a>	covered by	<a href="#">H01H 33/82</a>
<a href="#">H01H 33/825</a>	covered by	<a href="#">H01H 33/83</a>
<a href="#">H01H 33/835</a>	covered by	<a href="#">H01H 33/86</a>
<a href="#">H01H 33/867</a>	covered by	

## H01H

(continued)

H01H 33/873  
H01H 33/915  
H01H 33/985  
H01H 33/99

covered by  
covered by  
covered by  
covered by

[H01H 33/86](#)  
[H01H 33/91](#)  
[H01H 33/98](#)  
[H01H 33/98](#)

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

**Electric switches**

1/021 . . Composite materials

**NOTES**

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

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

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

1/0233 . . . . and containing carbides

1/0237 . . . . and containing oxides

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

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

1/02376 . . . . . {containing as major component SnO<sub>2</sub>}

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

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

1/027 . . . containing carbon particles or fibres

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

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

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

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

1/08 . . wetted with mercury

1/10 . . Laminated contacts with divided contact surface

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

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

1/14 . . by abutting

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

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

1/18 . . . with subsequent sliding

1/20 . . . Bridging contacts {(for circuit breakers [H01H 73/045](#))}1/2008 . . . . {Facilitate mounting or replacing contact bridge and pressure spring on carrier ([H01H 11/0012](#) takes precedence)}

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

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

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

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

2001/001 . {providing easy replacement of contacts}

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

1/0201 . . {Materials for reed contacts}

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

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

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

2001/0208 . . {containing rhenium}

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

- 2001/5877 . . {with provisions for direct mounting on a battery pole}
- 2001/5883 . . {the extension of the contact being crimped around a wire}
- 2001/5888 . . {Terminals of surface mounted devices [SMD]}
- 2001/5894 . . {the extension of the contact being welded to a wire or a bus}
- 1/60 . Auxiliary means structurally associated with the switch for cleaning or lubricating contact-making surfaces (cleaning by normal sliding of contacts [H01H 1/18](#), [H01H 1/36](#))
- 1/605 . . {Cleaning of contact-making surfaces by relatively high voltage pulses}
- 1/62 . Heating or cooling of contacts
- 1/64 . Protective enclosures, baffle plates, or screens for contacts (for arc-extinguishing [H01H 9/30](#); for mercury contacts [H01H 29/04](#))
- 1/645 . . {containing getter material (for explosion inhibiting in explosion-proofcases [H01H 9/046](#); for vacuum switches [H01H 33/6683](#))}
- 1/66 . . Contacts sealed in an evacuated or gas-filled envelope, e.g. magnetic dry-reed contacts
- 3/00 Mechanisms for operating contacts (snap-action arrangements [H01H 5/00](#); devices for introducing a predetermined time delay [H01H 7/00](#); {for tap changers [H01H 9/0027](#)}; thermal actuating or release means [H01H 37/02](#))**
  - 3/001 . {Means for preventing or breaking contact-welding}
- 2003/002 . . {with lockout, e.g. two contact pairs in series}
- 3/004 . {for operating contacts periodically}
- 3/005 . {making use of superconductivity, e.g. levitation switch}
- 2003/007 . {the contacts being actuated by deformation of a flexible housing}
- 2003/008 . {with a haptic or a tactile feedback controlled by electrical means, e.g. a motor or magnetofriction}
- 3/02 . Operating parts, i.e. for operating driving mechanism by a mechanical force external to the switch
  - 3/0206 . . {Combined operation of electric switch and of fluid control device}
  - 3/0213 . . {Combined operation of electric switch and variable impedance, e.g. resistor, capacitor ([H01H 9/061](#) takes precedence)}
  - 3/022 . . {Emergency operating parts, e.g. for stop-switch in dangerous conditions}
    - 3/0226 . . . {operated by a pull cord}
- 2003/0233 . . . {for alarm triggering, e.g. fire alarm, emergency off switches operated by breaking a glass}
- 2003/024 . . . {Resetting of bistable emergency operating part by pulling it}
- 2003/0246 . . . {Resetting of bistable emergency operating part by rotating itself or an accessory}
- 3/0253 . . {two co-operating contacts actuated independently (for combined circuit-breaker-contactors [H01H 89/10](#))}
- 2003/026 . . {specially adapted to avoid injury to occupants of a car during an accident}
- 2003/0266 . . {Operating part bringable in an inoperative position by an electrical drive}
- 2003/0273 . . {Manually irreversibly actuated switch}
- 2003/028 . . {Rotating knob or lever or tumbler that can be turned or pushed by hand in only one direction, e.g. by making inaccessible one side of a tumbler}
- 2003/0286 . . {having a weak point breaking or uncoupling on abnormal external force}
- 2003/0293 . . {with an integrated touch switch}
  - 3/04 . Levers (tumblers [H01H 23/14](#))
  - 3/06 . . Means for securing to shaft of driving mechanism
  - 3/08 . . Turn knobs
- 2003/085 . . . {Retractable turn knobs, e.g. flush mounted}
- 3/10 . . . Means for securing to shaft of driving mechanism
- 2003/105 . . . . {with compensation of misalignment in the link between the operating part, the driving mechanism and the switch, e.g. misalignment between two axis}
- 3/12 . . Push-buttons
- 3/122 . . . {with enlarged actuating area, e.g. of the elongated bar-type; Stabilising means therefor}
  - 3/125 . . . . {using a scissor mechanism as stabiliser}
- 2003/127 . . . {Details of the key cap concerning the actuation by fingernails or having provision to allow usage with long fingernails}
- 3/14 . . adapted for operation by a part of the human body other than the hand, e.g. by foot
  - 3/141 . . . {Cushion or mat switches}
  - 3/142 . . . . {of the elongated strip type}
- 2003/143 . . . . {provisions for avoiding the contact actuation when the elongated strip is bended}
- 2003/145 . . . . {provisions for avoiding closure or contact damage during manufacturing or mounting}
- 2003/146 . . . . {being normally closed}
- 2003/147 . . . . {Special aspects regarding the peripheral edges of the mat switches}
- 2003/148 . . . . {the mat switch being composed by independently juxtaposed contact tiles, e.g. for obtaining a variable protected area}
- 3/16 . . adapted for actuation at a limit or other predetermined position in the path of a body, the relative movement of switch and body being primarily for a purpose other than the actuation of the switch, e.g. for a door switch, a limit switch, a floor-levelling switch of a lift
  - 3/161 . . . {for actuation by moving a closing member, e.g. door, cover, lid ([H01H 27/002](#) takes precedence; the switch controlling enclosed equipment [H01H 9/226](#); safety arrangements on doors of dishwashers [A47L 15/4236](#), of laundry washing machines [D06F 37/42](#), of ovens [F24C 14/00](#), [F24C 15/022](#); locks with means for operating switches [E05B 17/22](#); alarm locks [E05B 45/06](#); safety edges for power-operated wings [E05F 15/40](#); safety devices in connection with the locking of doors, covers, guards, or like members giving access to movable machine parts [F16P 3/08](#); of microwave ovens [H05B 6/76](#))}
- 3/162 . . . . {associated with a hinge of the closing member}
- 3/163 . . . . {associated with locking or manipulating means of the closing member}



- 2003/165 . . . . {associated with an edge of the closing member}
- 3/166 . . . {Self-adjusting mountings, transmissions and the like}
- 2003/167 . . . . {with locking of the adjusted parts in the adjusted position by a separate action}
- 3/168 . . . {operated by movement in any direction}
- 3/18 . . . the movement in one direction being intentionally by hand, e.g. for setting automatically cancelled trafficators
- 3/20 . . wherein an auxiliary movement thereof, or of an attachment thereto, is necessary before the main movement is possible or effective, e.g. for unlatching, for coupling
- 3/22 . Power arrangements internal to the switch for operating the driving mechanism
- 3/222 . . {using electrodynamic repulsion}
- 2003/225 . . . {with coil contact, i.e. the movable contact itself forms a secondary coil in which the repulsing current is induced by an operating current in a stationary coil}
- 3/227 . . {Interlocked hand- and power-operating mechanisms}
- 3/24 . . using pneumatic or hydraulic actuator {(for storing energy in a spring motor [H01H 3/301](#))}
- 3/26 . . using dynamo-electric motor (for storing energy in a spring motor [H01H 3/30](#))
- 3/262 . . . {using a centrifugal mechanism}
- 3/264 . . . {using a travelling nut mechanism}
- 2003/266 . . . {having control circuits for motor operating switches, e.g. controlling the opening or closing speed of the contacts}
- 2003/268 . . . {using a linear motor}
- 3/28 . . using electromagnet (for storing energy in a spring motor [H01H 3/30](#); for operating relays [H01H 45/00](#))
- 3/30 . . using spring motor
- 3/3005 . . . {Charging means}
- 3/301 . . . . {using a fluid actuator}
- 3/3015 . . . . {using cam devices}
- 3/3021 . . . . {using unidirectional coupling}
- 3/3026 . . . . {in which the closing spring charges the opening spring or *vice versa*}
- 3/3031 . . . {Means for locking the spring in a charged state}
- 2003/3036 . . . . {using of balls or rollers in the locking device}
- 3/3042 . . . {using a torsion spring}
- 3/3047 . . . {adapted for operation of a three-position switch, e.g. on-off-earth}
- 3/3052 . . . {Linear spring motors}
- 2003/3057 . . . {provisions for avoiding idling, e.g. preventing release of stored energy when a breaker is closed, or when the springs are not fully charged}
- 2003/3063 . . . {Decoupling charging handle or motor at end of charging cycle or during charged condition}
- 2003/3068 . . . {Housing support frame for energy accumulator and cooperating mechanism}
- 2003/3073 . . . {Indication of the charge on the spring motor}
- 2003/3078 . . . {using an inertia element, e.g. a flywheel, to controll the energy released by the spring}
- 2003/3084 . . . {Kinetic energy of moving parts recuperated by transformation into potential energy in closing or opening spring to be used in next operation}
- 2003/3089 . . . {Devices for manual releasing of locked charged spring motor; Devices for remote releasing}
- 2003/3094 . . . {allowing an opening - closing - opening [OCO] sequence}
- 3/32 . Driving mechanisms, i.e. for transmitting driving force to the contacts ([snap-action arrangements H01H 5/00](#); introducing a predetermined time delay [H01H 7/00](#))
- 2003/323 . . {the mechanisms being adjustable}
- 2003/326 . . {using bearings}
- 3/34 . . using ratchet
- 3/36 . . using belt, chain, or cord
- 3/38 . . using spring or other flexible shaft coupling
- 3/40 . . using friction, toothed, or screw-and-nut gearing
- 2003/405 . . . {using a walking nut}
- 3/42 . . using cam or eccentric
- 3/44 . . using Geneva movement
- 3/46 . . using rod or lever linkage, e.g. toggle
- 2003/463 . . . {using a blade spring lever for perpendicular force transmission}
- 2003/466 . . . {using a living hinge to connect the levers}
- 3/48 . . using lost-motion device
- 3/50 . . with indexing or locating means, e.g. indexing by ball and spring
- 3/503 . . . {making use of electromagnets}
- 2003/506 . . . {making use of permanent magnets}
- 3/52 . . with means to ensure stopping at intermediate operative positions
- 3/54 . Mechanisms for coupling or uncoupling operating parts, driving mechanism or contacts
- 3/56 . . using electromagnetic clutch
- 3/58 . . using friction, toothed, or other mechanical clutch
- 3/60 . Mechanical arrangements for preventing or damping vibration or shock
- 3/605 . . {making use of a fluid damper}
- 3/62 . Lubricating means structurally associated with the switch (for lubricating contact-making surfaces [H01H 1/60](#))
- 5/00 Snap-action arrangements, i.e. in which during a single opening operation or a single closing operation energy is first stored and then released to produce or assist the contact movement**
- 5/02 . Energy stored by the attraction or repulsion of magnetic parts
- 5/04 . Energy stored by deformation of elastic members (by deformation of bimetallic elements in thermally-actuated switches [H01H 37/54](#))
- 5/045 . . {making use of cooperating spring loaded wedging or camming parts between operating member and contact structure}
- 5/06 . . by compression or extension of coil springs
- 5/08 . . . one end of spring transmitting movement to the contact member when the other end is moved by the operating part
- 5/10 . . . one end of spring being fixedly connected to the stationary or movable part of the switch and the other end reacting with a movable or stationary rigid member respectively through pins, cams, toothed or other shaped surfaces

5/12	. . . having two or more snap-action motions in succession	2009/0088	. {Details of rotatable shafts common to more than one pole or switch unit}
5/14	. . by twisting of torsion members	2009/0094	. {Details of rotatable shafts which are subdivided; details of the coupling means thereof}
5/16	. . . with auxiliary means for temporarily holding parts until torsion member is sufficiently strained	9/02	. Bases, casings, or covers ( <a href="#">accommodating more than one switch or a switch and another electrical component H02B 1/26</a> )
5/18	. . by flexing of blade springs	9/0207	. . {Adjustable mounting of casings}
5/20	. . . single blade moved across dead-centre position	9/0214	. . {Hand-held casings}
5/22	. . . blade spring with at least one snap-acting leg and at least one separate contact-carrying or contact-actuating leg	2009/0221	. . . {the switches being fixed to the operator's hand, e.g. integrated in a glove or fixed to a ring}
5/24	. . . . having three legs	9/0228	. . . {Line cord switches}
5/26	. . . having two or more snap-action motions in succession	9/0235	. . . {specially adapted for remote control, e.g. of audio or video apparatus}
5/28	. . . two separate blade springs forming a toggle	9/0242	. . . . {Protective enclosures; Cushioning means}
5/30	. . by buckling of disc springs	9/025	. . . . {Stands or organisers to facilitate location or operation}
<b>7/00</b>	<b>Devices for introducing a predetermined time delay between the initiation of the switching operation and the opening or closing of the contacts</b> ( <a href="#">time or time-programme switches H01H 43/00</a> )	2009/0257	. . . . {Multisided remote control, comprising control or display elements on at least two sides, e.g. front and back surface}
7/02	. with fluid timing means	9/0264	. . {Protective covers for terminals}
7/03	. . with dash-pots	9/0271	. . {structurally combining a switch and an electronic component ( <a href="#">for relays H01H 50/021</a> )}
7/04	. . with flies, i.e. fan governors	2009/0278	. . {Casings containing special noise reduction means, e.g. elastic foam between inner and outer casing}
7/06	. with thermal timing means ( <a href="#">thermally actuated switches H01H 37/00</a> )	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 ( <a href="#">vacuum switches 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> (casings for switchgear <a href="#">H02B 1/26</a> ; casings for electrical apparatus in general <a href="#">H05K 5/00</a> )	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</a> )
9/0072	. {particular to three-phase switches ( <a href="#">synchronous switching H01H 9/563</a> )}		
2009/0077	. {using recyclable materials, e.g. for easier recycling or minimising the packing material}		
2009/0083	. {using redundant components, e.g. two pressure tubes for pressure switch}		

9/102	. . {Fuses mounted on or constituting the movable contact parts of the switch}	2009/265	. . . {with interlocking of more than two switches}
9/104	. . {with interlocking mechanism between switch and fuse}	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}
9/106	. . {fuse and switch being connected in parallel}	9/28	. . for locking switch parts by a key or equivalent removable member ( <a href="#">switches operated by a key H01H 27/00</a> ; <a href="#">locking by removable part of two-part coupling device H01R</a> )
2009/108	. . {Building a sliding and/or a removable bridging connector for batteries}	9/281	. . . {making use of a padlock ( <a href="#">H01H 9/287</a> takes precedence)}
9/12	. Means for earthing parts of switch not normally conductively connected to the contacts	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}
9/14	. Adaptation for built-in safety spark gaps	9/283	. . . . . {the part being removable}
9/16	. Indicators for switching condition, e.g. "on" or "off"	9/285	. . . {Locking mechanisms incorporated in the switch assembly and operable by a key or a special tool}
9/161	. . {comprising light emitting elements}	9/286	. . . {making use of a removable locking part acting directly on the operating part ( <a href="#">H01H 9/281</a> takes precedence)}
9/162	. . . {Means to facilitate removal or replacement of light-emitting elements}	9/287	. . . {wherein the operating part is made inaccessible or more difficult to access by a lid, cover or guard, e.g. lockable covers}
2009/164	. . . {the light emitting elements being incorporated in and movable with the operating part}	2009/288	. . . {Provisions relating to welded contacts}
9/165	. . {comprising numbered dials ( <a href="#">thumb-wheel switches H01H 19/001</a> )}	9/30	. Means for extinguishing or preventing arc between current-carrying parts
9/167	. . {Circuits for remote indication ( <a href="#">for protection circuits H02H 3/04</a> ; <a href="#">for distribution networks H02J 13/00</a> )}	9/302	. . {wherein arc-extinguishing gas is evolved from stationary parts}
9/168	. . {making use of an electromagnetic wave communication}	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}
9/18	. Distinguishing marks on switches, e.g. for indicating switch location in the dark; Adaptation of switches to receive distinguishing marks	2009/307	. . {with slow break, e.g. for AC current waiting for a zero crossing}
9/181	. . {using a programmable display, e.g. LED or LCD}	9/32	. . Insulating body insertable between contacts
9/182	. . {Illumination of the symbols or distinguishing marks ( <a href="#">H01H 9/181</a> takes precedence)}	9/34	. . Stationary parts for restricting or subdividing the arc, e.g. barrier plate
2009/183	. . . {Provisions for enhancing the contrast between the illuminated symbol and the background or between juxtaposed symbols}	9/341	. . . {Barrier plates carrying electrodes}
2009/184	. . . {Illumination of symbols by using laser light}	9/342	. . . {Venting arrangements for arc chutes}
9/185	. . {Fluorescent or phosphorescent symbols or distinguishing marks ( <a href="#">H01H 9/181</a> takes precedence)}	2009/343	. . . . {with variable venting aperture function of arc chute internal pressure, e.g. resilient flap-valve or check-valve}
2009/186	. . {using an electroluminescent panel}	9/345	. . . {Mounting of arc chutes}
2009/187	. . {having symbols engraved or printed by laser}	9/346	. . . {Details concerning the arc formation chamber}
2009/188	. . {with indication of rating}	2009/347	. . . {using lids for closing the arc chamber after assembly}
2009/189	. . {with a tactile symbol or indication, e.g. for blind people}	2009/348	. . . {Provisions for recirculation of arcing gasses to improve the arc extinguishing, e.g. move the arc quicker into the arcing chamber}
9/20	. Interlocking, locking, or latching mechanisms (contacts adapted to act as latches <a href="#">H01H 1/52</a> ; by an auxiliary movement of the operating part or of an attachment thereto <a href="#">H01H 3/20</a> ; <a href="#">for withdrawable switchgear H02B 11/00</a> )	9/36	. . . Metal parts
9/22	. . for interlocking between casing, cover, or protective shutter and mechanism for operating contacts ( <a href="#">explosion-proof cases H01H 9/045</a> ; <a href="#">built-in fuses and interlocking mechanisms H01H 9/104</a> ; <a href="#">by automatic release of circuit breakers H01H 71/126</a> )	9/362	. . . . {Mounting of plates in arc chamber}
9/223	. . . {Defeatable locking means}	2009/365	. . . . {using U-shaped plates}
9/226	. . . {the casing containing electrical equipment other than and operated by the switch}	2009/367	. . . . {defining a recurrent path, e.g. the subdivided arc is moved in a closed path between each pair of splitter plates}
9/24	. . for interlocking two or more parts of the mechanism for operating contacts	9/38	. . Auxiliary contacts on to which the arc is transferred from the main contacts ( <a href="#">using arcing-horns H01H 9/46</a> )
9/26	. . for interlocking two or more switches ( <a href="#">H01H 13/568</a> takes precedence); by a detachable member <a href="#">H01H 9/28</a> (; <a href="#">for electromagnetic relays H01H 50/323</a> )	9/383	. . . {Arcing contact pivots relative to the movable contact assembly}
9/262	. . . {using flexible transmission elements, e.g. Bowden cable}		

9/386	. . . {Arcing contact pivots relative to the fixed contact assembly}	11/0012	. . {for converting normally open to normally closed switches and <i>vice versa</i> }
9/40	. . Multiple main contacts for the purpose of dividing the current through, or potential drop along, the arc {(multiple parallel contact bars <a href="#">H01H 1/226</a> )}	11/0018	. . {for allowing different operating parts}
9/42	. . Impedances connected with contacts	2011/0025	. . . {with provisions for allowing different orientation of the operating part, e.g. turning knob can be mounted in different positions}
9/44	. . using blow-out magnet	11/0031	. . {for allowing different types or orientation of connections to contacts}
9/443	. . . {using permanent magnets}	2011/0037	. . . {with removable or replaceable terminal blocks}
9/446	. . . {using magnetisable elements associated with the contacts}	2011/0043	. . {for modifying the number or type of operating positions, e.g. momentary and stable}
9/46	. . using arcing-horn (using blow-out magnet <a href="#">H01H 9/44</a> ; arcing-horns <i>per se</i> <a href="#">H01T 4/14</a> )	11/005	. {of reed switches}
9/465	. . . {Shunt circuit closed by transferring the arc onto an auxiliary electrode}	11/0056	. {comprising a successive blank-stamping, insert-moulding and severing operation}
9/48	. Means for preventing discharge to non-current-carrying parts, e.g. using corona ring	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> )}
9/50	. Means for detecting the presence of an arc or discharge	2011/0068	. . {measuring the temperature of the switch or parts thereof}
9/52	. Cooling of switch parts ( <a href="#">cooling of contacts H01H 1/62</a> )	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}
2009/523	. . {by using heat pipes}	2011/0081	. {using double shot moulding, e.g. for forming elastomeric sealing elements on form stable casing}
2009/526	. . {of the high voltage switches}	2011/0087	. {Welding switch parts by use of a laser beam}
9/54	. Circuit arrangements not adapted to a particular application of the switching device and for which no provision exists elsewhere	2011/0093	. {Standardization, e.g. limiting the factory stock by limiting the number of unique, i.e. different components}
9/541	. . {Contacts shunted by semiconductor devices}	11/02	. for mercury switches
9/542	. . . {Contacts shunted by static switch means}	11/04	. of switch contacts
2009/543	. . . . {third parallel branch comprising an energy absorber, e.g. MOV, PTC, Zener}	11/041	. . {by bonding of a contact marking face to a contact body portion}
2009/544	. . . . {the static switching means being an insulated gate bipolar transistor, e.g. IGBT, Darlington configuration of FET and bipolar transistor}	11/042	. . . {by mechanical deformation}
2009/545	. . . . {comprising a parallel semiconductor switch being fired optically, e.g. using a photocoupler,}	11/043	. . . {by resistance welding}
2009/546	. . . . {the static switching means being triggered by the voltage over the mechanical switch contacts}	11/045	. . . {with the help of an intermediate layer ( <a href="#">contacts provided with a solder layer H01H 1/0231</a> )}
9/547	. . {Combinations of mechanical switches and static switches, the latter being controlled by the former}	2011/046	. . . {by plating}
9/548	. . {Electromechanical and static switch connected in series}	2011/047	. . . {on both sides of the contact body portion}
9/56	. . for ensuring the operation of the switch at a predetermined point in the cycle	11/048	. . {by powder-metallurgical processes}
9/563	. . . {for multipolar switches, e.g. different timing for different phases, selecting phase with first zero-crossing}	11/06	. . Fixing of contacts to carrier {; Fixing of contacts to insulating carrier}
2009/566	. . . {with self learning, e.g. measured delay is used in later actuations}	2011/062	. . . {by inserting only}
11/00	<b>Apparatus or processes specially adapted for manufacture of electric switches</b> ( <a href="#">processes specially adapted for manufacture of rectilinearly movable switches having a plurality of operating members associated with different sets of contacts, e.g. keyboards, H01H 13/88</a> ; <a href="#">processes or apparatus specially adapted for the manufacture or treatment of microstructural devices or systems, e.g. in combination with electrical devices, B81C</a> )	2011/065	. . . {by plating metal or conductive rubber on insulating substrate, e.g. Molded Interconnect Devices [MID]}
11/0006	. {for converting electric switches ( <a href="#">H01H 13/564 takes precedence</a> )}	2011/067	. . . {by deforming, e.g. bending, folding or caulking, part of the contact or terminal which is being mounted}
		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>
		13/02	. Details ( <a href="#">specially adapted for rectilinearly movable switches having operating members associated with different sets of contacts, e.g. keyboards, H01H 13/70</a> )
		13/023	. . {Light-emitting indicators (for multi-layer switches <a href="#">H01H 13/83</a> )}



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

- 13/704 . . . characterised by the layers, e.g. by their material or stucture ([H01H 13/703 takes precedence](#))
- 13/705 . . . characterised by construction, mounting or arrangement of operating parts, e.g. push-buttons or keys
- 13/7057 . . . . characterised by the arrangement of operating parts in relation to each other, e.g. pre-assembled groups of keys
- 13/7065 . . . . characterised by the mechanism between keys and layered keyboards
- 13/7073 . . . . . characterised by springs, e.g. Euler springs
- 13/72 . . wherein the switch has means for limiting the number of operating members that can concurrently be in the actuated position
- 13/74 . . . each contact set returning to its original state only upon actuation of another of the operating members
- 13/76 . . wherein some or all of the operating members actuate different combinations of the contact sets, e.g. ten operating members actuating different combinations of four contact sets
- 13/78 . . characterised by the contacts or the contact sites
- 13/785 . . . characterised by the material of the contacts, e.g. conductive polymers
- 13/79 . . . characterised by the form of the contacts, e.g. interspersed fingers or helical networks
- 13/80 . . . characterised by the manner of cooperation of the contacts, e.g. with both contacts movable or with bounceless contacts
- 13/803 . . . characterised by the switching function thereof, e.g. normally closed contacts or consecutive operation of contacts
- 13/807 . . . characterised by the spatial arrangement of the contact sites, e.g. superimposed sites
- 13/81 . . characterised by electrical connections to external devices
- 13/82 . . characterised by contact space venting means
- 13/83 . . characterised by legends, e.g. Braille, liquid crystal displays, light emitting or optical elements
- 13/84 . . characterised by ergonomic functions, e.g. for miniature keyboards; characterised by operational sensory functions, e.g. sound feedback ([legends H01H 13/83](#))
- 13/85 . . . characterised by tactile feedback features
- 13/86 . . characterised by the casing, e.g. sealed casings or casings reducible in size
- 13/88 . . Processes specially adapted for manufacture of rectilinearly movable switches having a plurality of operating members associated with different sets of contacts, e.g. keyboards
- 15/00 Switches having rectilinearly-movable operating part or parts adapted for actuation in opposite directions, e.g. slide switch**
- 15/005 . {adapted for connection with printed circuit boards (in general [H01H 1/5805](#))}
- 15/02 . Details
- 15/025 . . {Light-emitting indicators}
- 15/04 . . Stationary parts; Contacts mounted thereon
- 15/06 . . Movable parts; Contacts mounted thereon
- 15/08 . . . Contact arrangements for providing make-before-break operation, e.g. for on-load tap-changing
- 15/10 . . . Operating parts
- 15/102 . . . . {comprising cam devices}
- 15/105 . . . . . {Adjustable cams}
- 15/107 . . . . . {actuating conventional selfcontained microswitches ([H01H 15/105 takes precedence](#))}
- 15/12 . . . . adapted for operation by a part of the human body other than the hand, e.g. by foot
- 15/14 . . . . adapted for actuation at a limit or other predetermined position in the path of a body, the relative movement of switch and body being primarily for a purpose other than the actuation of the switch, e.g. door switch, limit switch, floor-levelling switch of a lift
- 15/16 . . . Driving mechanisms
- 15/18 . . . . acting with snap action
- 15/20 . . . . with means for introducing a predetermined time delay
- 15/22 . having a single operating part protruding from different sides of switch casing for alternate actuation from opposite ends
- 15/24 . having a single operating part only protruding from one side of the switch casing for alternate pushing and pulling
- 17/00 Switches having flexible operating part adapted only for pulling, e.g. cord, chain {(for emergency stop switches [H01H 3/0226](#))}**
- 17/02 . Details
- 17/04 . . Stationary parts ([guides H01H 17/14](#))
- 17/06 . . Movable parts ([guides H01H 17/14](#))
- 17/08 . . . Operating part, e.g. cord
- 17/10 . . . . adapted for operation by a part of the human body other than the hand, e.g. by foot
- 17/12 . . . . adapted for actuation at a limit or other predetermined position in the path of a body, the relative movement of switch and body being primarily for a purpose other than the actuation of the switch, e.g. door switch, limit switch, floor-levelling switch of a lift
- 17/14 . . Guiding means for flexible operating part
- 17/16 . having a single flexible operating part adapted for pulling at one end only
- 17/165 . . {secured to a part of the switch mechanism that has only rectilinear movement}
- 17/18 . . secured to part of the switch driving mechanism that has only angular movement
- 17/20 . . . the contact returning to its original state immediately upon removal of operating force
- 17/22 . . . the contact returning to its original state upon the next application of operating force
- 17/24 . . secured to a part of the switch driving mechanism that has both angular and rectilinear motion
- 17/26 . having two flexible operating parts; having a single operating part adapted for pulling at both ends
- 17/28 . . secured to part or parts of the switch driving mechanism having only rectilinear motion
- 17/30 . . secured to a part or parts of the switch driving mechanism having only angular motion
- 19/00 Switches operated by an operating part which is rotatable about a longitudinal axis thereof and which is acted upon directly by a solid external to the switch, e.g. by a hand (rotary current collectors, distributors or interrupters [H01R 39/00](#))**
- 19/001 . {Thumb wheel switches}

- 19/003 . . {having a pushbutton actuator}
- 19/005 . {Electromechanical pulse generators ([integrated in time-pieces G04C 3/007](#))}
- 2019/006 . . {being rotation direction sensitive, e.g. the generated pulse or code depends on the direction of rotation of the operating part}
- 2019/008 . {with snap mounting of rotatable part on fixed part, e.g. rotor on stator, operating knob on switch panel}
- 19/02 . Details
- 19/025 . . {Light-emitting indicators}
- 19/03 . . Means for limiting the angle of rotation of the operating part
- 19/04 . . Cases; Covers
- 19/06 . . . Dustproof, splashproof, drip-proof, waterproof, or flameproof casings
- 19/065 . . . . {Casings hermetically closed by a diaphragm through which passes an actuating member ([vacuum switches H01H 33/66](#))}
- 19/08 . . Bases; Stationary contacts mounted thereon
- 19/10 . . Movable parts; Contacts mounted thereon
- 19/11 . . . with indexing means
- 19/115 . . . . {using molded elastic parts only}
- 19/12 . . . Contact arrangements for providing make-before-break operation, e.g. for on-load tap-changing
- 19/14 . . . Operating parts, e.g. turn knob
- 2019/143 . . . . {having at least two concentric turn knobs}
- 2019/146 . . . . {Roller type actuators}
- 19/16 . . . . adapted for operation by a part of the human body other than the hand, e.g. by foot
- 19/18 . . . . adapted for actuation at a limit or other predetermined position in the path of a body, the relative movement of switch and body being primarily for a purpose other than the actuation of the switch, e.g. door switch, limit switch, floor-levelling switch of a lift
- 19/183 . . . . . {adapted for operation by the simultaneous action of two cam plates, rotating at different speeds}
- 19/186 . . . . . {with travelling nuts}
- 19/20 . . . Driving mechanisms allowing angular displacement of the operating part to be effective in either direction
- 19/22 . . . . incorporating lost motion
- 19/24 . . . . acting with snap action
- 19/26 . . . . with means for introducing a predetermined time delay
- 19/28 . . . Driving mechanisms allowing angular displacement of the operating part to be effective or possible in only one direction
- 19/30 . . . . incorporating lost motion
- 19/32 . . . . acting with snap action
- 19/34 . . . . with means for introducing a predetermined time delay
- 19/36 . the operating part having only two operative positions, e.g. relatively displaced by 180 degrees
- 19/38 . . Change-over switches
- 19/40 . . . having only axial contact pressure
- 19/42 . . providing more than two electrically different conditions, e.g. for closing either or both of two circuits
- 19/44 . . . having only axial contact pressure
- 19/46 . the operating part having three operative positions, e.g. off/star/delta
- 19/48 . . having only axial contact pressure
- 19/50 . the operating part having four operative positions, e.g. off/two-in-series/one-only/two-in-parallel
- 19/52 . . having only axial contact pressure
- 19/54 . the operating part having at least five or an unspecified number of operative positions
- 19/56 . . Angularly-movable actuating part carrying contacts, e.g. drum switch
- 19/563 . . . {with an initial separation movement perpendicular to the switching movement}
- 19/566 . . . {in which the contact making surfaces are inclined, i.e. not perpendicular, to the axial or radial direction}
- 19/58 . . . having only axial contact pressure, e.g. disc switch, wafer switch
- 19/585 . . . . {provided with printed circuit contacts}
- 19/60 . . Angularly-movable actuating part carrying no contacts
- 19/605 . . . {in which the actuation of the contacts depends on the direction of rotation}
- 19/62 . . . Contacts actuated by radial cams
- 19/623 . . . . {Adjustable cams}
- 19/626 . . . . {actuating bridging contacts ([H01H 19/623 takes precedence](#))}
- 19/63 . . . Contacts actuated by axial cams ([H01H 19/6355 takes precedence](#))
- 19/635 . . . Contacts actuated by rectilinearly-movable member linked to operating part, e.g. by pin and slot
- 19/6355 . . . . {using axial cam devices for transforming the angular movement into linear movement along the axis of rotation}
- 19/64 . Encased switches adapted for ganged operation when assembled in a line with identical switches, e.g. stacked switches
- 21/00 **Switches operated by an operating part in the form of a pivotable member acted upon directly by a solid body, e.g. by a hand ([tumbler or rocker switches H01H 23/00](#); switches having an operating part movable angularly in more than one plane [H01H 25/04](#))**
- 21/02 . Details
- 21/025 . . {Light-emitting indicators}
- 21/04 . . Cases; Covers
- 21/06 . . . interlocked with operating mechanism
- 21/08 . . . Dustproof, splashproof, drip-proof, waterproof, or flameproof casings
- 21/085 . . . . {Casings hermetically closed by a diaphragm through which passes an actuating member ([vacuum switches H01H 33/66](#))}
- 21/10 . . . Casing of switch constituted by a handle serving a purpose other than the actuation of the switch
- 21/12 . . Bases; Stationary contacts mounted thereon
- 21/14 . . Means for increasing contact pressure
- 21/16 . . Adaptation for built-in fuse
- 21/165 . . . {Fuses mounted on, or constituting the movable contact parts of, the switch}
- 21/18 . . Movable parts; Contacts mounted thereon
- 21/20 . . . Contact arrangements for providing make-before-break operation, e.g. for on-load tap-changing
- 21/22 . . . Operating parts, e.g. handle

2021/225	. . . . {with push-pull operation, e.g. which can be pivoted in both directions by pushing or pulling on the same extremity of the operating member}	21/60	. . Change-over switches with stable intermediate position
21/24	. . . . biased to return to normal position upon removal of operating force	21/86	. Switches with abutting contact carried by operating part, e.g. telegraph tapping key
21/245	. . . . . {the contact returning to its original state upon the next application of operating force}	21/88	. . with intermediate position of rest
21/26	. . . . . adapted for operation by a part of the human body other than the hand, e.g. by foot	<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>
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	<b>NOTE</b>	
21/282	. . . . . {for actuation by moving a closing member, e.g. door, cover (the switch controlling enclosed equipment <a href="#">H01H 9/226</a> )}		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
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}	23/003	. {with more than one electrically distinguishable condition in one or both positions}
2021/287	. . . . . {with adjustable head, e.g. the actuator head can have different positions in relation to the limit switch itself}	23/006	. {adapted for connection with printed circuit boards ( <a href="#">connections to printed circuits in general H01H 1/5805</a> )}
21/30	. . . . not biased to return to a normal position upon removal of operating force	23/02	. Details
21/32	. . . . . adapted for operation by a part of the human body other than the hand, e.g. by foot	23/025	. . {Light-emitting indicators}
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	23/04	. . Cases; Covers
21/36	. . . Driving mechanisms	23/06	. . . Dustproof, splashproof, drip-proof, waterproof, or flameproof casings
21/38	. . . . incorporating lost motion	23/065	. . . . {Casings hermetically closed by a diaphragm through which passes an actuating member ( <a href="#">vacuum switches H01H 33/66</a> )}
21/40	. . . . having snap action	23/08	. . Bases; Stationary contacts mounted thereon
21/42	. . . . . produced by compression or extension of coil spring	23/10	. . Adaptation for built-in fuse
21/44	. . . . . produced by flexing blade springs	23/105	. . . {Fuses mounted on, or constituting the movable part of, the switch}
21/46	. . . . . with two or more snap-action motions in succession	23/12	. . Movable parts; Contacts mounted thereon
21/48	. . . . incorporating a ratchet mechanism	23/14	. . . Tumblers
21/50	. . . . with indexing or latching means, e.g. indexing by ball and spring; with means to ensure stopping at intermediate operative positions	23/141	. . . . {provided with extensions, e.g. for actuation by a child}
21/52	. . . . with means for introducing a predetermined time delay	23/143	. . . . {having a generally flat elongated shape}
21/54	. Lever switches with blade-type contact co-operating with one or two spring-clip contacts, e.g. knife switch	23/145	. . . . . {the actuating surface having two slightly inclined areas extending from the middle outward}
21/56	. . making contact in one position only	23/146	. . . . {having a generally tubular or conical elongated shape, e.g. dolly}
21/58	. . Change-over switches without stable intermediate position	23/148	. . . . {actuated by superimposed sliding element ( <a href="#">H01H 23/141 takes precedence</a> )}
		23/16	. . . Driving mechanisms
		23/162	. . . . {incorporating links interconnecting tumbler and contact arm}
		23/164	. . . . {with rectilinearly movable member carrying the contacts}
		23/166	. . . . {with positive action}
		23/168	. . . . {using cams}
		23/18	. . . . incorporating lost motion
		23/20	. . . . having snap action
		23/205	. . . . . {using a compression spring between tumbler and an articulated contact plate}
		23/22	. . . . with means for introducing a predetermined time delay
		23/24	. with two operating positions
		23/26	. . one of which positions is unstable
		23/28	. with three operating positions
		23/30	. . with stable centre positions and one or both end positions unstable



<b>25/00</b>	<b>Switches with compound movement of handle or other operating part</b>	27/08	<ul style="list-style-type: none"> <li>wherein the key cannot be removed until the switch is returned to its original position (<a href="#">H01H 27/063</a>, <a href="#">H01H 27/063</a> take precedence)</li> </ul>
25/002	<ul style="list-style-type: none"> <li>{having an operating member rectilinearly slidable in different directions}</li> </ul>	27/10	<ul style="list-style-type: none"> <li>Switch operated by setting members according to a single predetermined combination out of several possible settings</li> </ul>
2025/004	<ul style="list-style-type: none"> <li>{the operating member being depressable perpendicular to the other directions}</li> </ul>	<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>
25/006	<ul style="list-style-type: none"> <li>{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}</li> </ul>	29/002	<ul style="list-style-type: none"> <li>{Inertia switches}</li> </ul>
25/008	<ul style="list-style-type: none"> <li>{Operating part movable both angularly and rectilinearly, the rectilinear movement being perpendicular to the axis of angular movement}</li> </ul>	29/004	<ul style="list-style-type: none"> <li>{Operated by deformation of container}</li> </ul>
25/04	<ul style="list-style-type: none"> <li>Operating part movable angularly in more than one plane, e.g. joystick</li> </ul>	29/006	<ul style="list-style-type: none"> <li>{Self interrupters, e.g. with periodic or other repetitive opening and closing of contacts}</li> </ul>
25/041	<ul style="list-style-type: none"> <li>{having a generally flat operating member depressible at different locations to operate different controls}</li> </ul>	2029/008	<ul style="list-style-type: none"> <li>{using micromechanics, e.g. micromechanical liquid contact switches or [LIMMS]}</li> </ul>
2025/043	<ul style="list-style-type: none"> <li>{the operating member being rotatable around wobbling axis for additional switching functions}</li> </ul>	29/02	<ul style="list-style-type: none"> <li>Details</li> </ul>
2025/045	<ul style="list-style-type: none"> <li>{having a rotating dial around the operating member for additional switching functions}</li> </ul>	29/04	<ul style="list-style-type: none"> <li>Contacts; Containers for liquid contacts</li> </ul>
2025/046	<ul style="list-style-type: none"> <li>{having a spherical bearing between operating member and housing or bezel}</li> </ul>	29/06	<ul style="list-style-type: none"> <li>Liquid contacts characterised by the material thereof</li> </ul>
2025/048	<ul style="list-style-type: none"> <li>{having a separate central push, slide or tumbler button which is not integral with the operating part that surrounds it}</li> </ul>	29/08	<ul style="list-style-type: none"> <li>Means for introducing a predetermined time delay</li> </ul>
25/06	<ul style="list-style-type: none"> <li>Operating part movable both angularly and rectilinearly, the rectilinear movement being along the axis of angular movement</li> </ul>	29/10	<ul style="list-style-type: none"> <li>by constricting the flow of the contact liquid</li> </ul>
25/065	<ul style="list-style-type: none"> <li>{using separate operating parts, e.g. a push button surrounded by a rotating knob}</li> </ul>	29/12	<ul style="list-style-type: none"> <li>Operating mechanisms adapted for operation by a part of the human body other than the hand, e.g. by foot</li> </ul>
<b>27/00</b>	<b>Switches operated by a removable member, e.g. key, plug, plate; Switches operated by setting members according to a single predetermined combination out of several possible settings (locking switch parts to prevent operation <a href="#">H01H 9/28</a>; combined with plug-and-socket connectors <a href="#">H01R</a>; with current-carrying plug <a href="#">H01R 31/08</a>)</b>	29/14	<ul style="list-style-type: none"> <li>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</li> </ul>
27/002	<ul style="list-style-type: none"> <li>{wherein one single insertion movement of a key comprises an unlocking stroke and a switch actuating stroke, e.g. security switch for safety guards}</li> </ul>	29/16	<ul style="list-style-type: none"> <li>operated by dipping soil contact into stationary contact liquid</li> </ul>
2027/005	<ul style="list-style-type: none"> <li>{the key receiving part having multiple openings to allow keys from different directions to operate the switch}</li> </ul>	29/18	<ul style="list-style-type: none"> <li>with level of surface of contact liquid displaced by non-electrical contact-making plunger</li> </ul>
27/007	<ul style="list-style-type: none"> <li>{the switch being lockable by remote control, e.g. by electromagnet}</li> </ul>	29/20	<ul style="list-style-type: none"> <li>operated by tilting contact-liquid container (<a href="#">centrifugal mercury switches <a href="#">H01H 29/26</a></a>)</li> </ul>
27/04	<ul style="list-style-type: none"> <li>Insulating plug or plate inserted between normally closed contacts</li> </ul>	29/22	<ul style="list-style-type: none"> <li>wherein contact is made and broken between liquid and solid</li> </ul>
27/06	<ul style="list-style-type: none"> <li>Key inserted and then turned to effect operation of the switch {(IC integrated in key and connected by turning key <a href="#">E05B 49/004</a>)}</li> </ul>	29/24	<ul style="list-style-type: none"> <li>wherein contact is made and broken between liquid and liquid</li> </ul>
27/063	<ul style="list-style-type: none"> <li>{wherein the switch cannot be moved to a third position, e.g. start position, unless the preceding movement was from a first position to a second position, e.g. ignition position (starting of engines and safety devices <a href="#">F02N 11/00</a>; safety means for electric spark ignition <a href="#">F02P 11/00</a>)}</li> </ul>	29/26	<ul style="list-style-type: none"> <li>with level of surface of contact liquid displaced by centrifugal action</li> </ul>
2027/066	<ul style="list-style-type: none"> <li>{having anti-tamper provisions, e.g. avoiding the removal of the lock cylinder}</li> </ul>	29/28	<ul style="list-style-type: none"> <li>with level of surface of contact liquid displaced by fluid pressure</li> </ul>
		29/30	<ul style="list-style-type: none"> <li>with level of surface of contact liquid displaced by expansion or evaporation thereof</li> </ul>
		29/32	<ul style="list-style-type: none"> <li>with contact made by a liquid jet, e.g. earthing switch with contact made by jet of water (<a href="#">operated by direct electrodynamic action <a href="#">H01H 53/00</a></a>)</li> </ul>
		<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>; switching arrangements for the supply or distribution of electric power <a href="#">H02B</a>)</b>
		31/003	<ul style="list-style-type: none"> <li>{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>)}</li> </ul>
		31/006	<ul style="list-style-type: none"> <li>{adapted to be operated by a hot stick; Hot sticks therefor}</li> </ul>
		31/02	<ul style="list-style-type: none"> <li>Details</li> </ul>
		31/023	<ul style="list-style-type: none"> <li>{Base and stationary contacts mounted thereon}</li> </ul>

31/026	. . {Movable parts and contacts mounted thereon}	33/021	. . {Use of solid insulating compounds resistant to the contacting fluid dielectrics and their decomposition products, e.g. to SF <sub>6</sub> (insulators or insulating bodies characterised by the insulating materials, selection of materials for their insulating or dielectric properties <a href="#">per se H01B 3/00</a> )}
31/04	. . Interlocking mechanisms (for interlocking with high-tension or heavy-current switches having arc-extinguishing or arc-preventing means <a href="#">H01H 33/52</a> )	33/022	. . {particular to three-phase circuit breakers (synchronous switching <a href="#">H01H 9/563</a> )}
31/06	. . . for interlocking between casing, cover, or protective shutter and mechanism for operating contacts	2033/024	. . . {with a triangular setup of circuit breakers}
31/08	. . . for interlocking two or more parts of the mechanism for operating contacts	33/025	. . {Terminal arrangements (for vacuum switches <a href="#">H01H 33/6606</a> )}
31/10	. . . for interlocking two or more switches (for interlocking with high-tension or heavy-current switches having arc-extinguishing or arc-preventing means <a href="#">H01H 33/52</a> )	33/027	. . {Integrated apparatus for measuring current or voltage}
31/12	. . Adaptation for built-in fuse	2033/028	. . {the cooperating contacts being both actuated simultaneously in opposite directions}
31/122	. . . {Fuses mounted on, or constituting the movable contact parts of, the switch}	33/04	. . Means for extinguishing or preventing arc between current-carrying parts (for switches in general <a href="#">H01H 9/30</a> )
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)}	33/045	. . . {for arcs formed during closing}
31/127	. . . . {Drop-out fuses}	33/06	. . . Insulating body insertable between contacts
31/14	. with bridging contact that is not electrically connected to either line contact in open position of switch	33/08	. . . Stationary parts for restricting or subdividing the arc, e.g. barrier plate
31/16	. . with angularly-movable bridging contact or contact-carrying member	2033/085	. . . . {using a flat arc chute, the width of arc chamber being only slightly greater than thickness of switch blade}
31/18	. . . actuated through the movement of one or more insulators	33/10	. . . . Metal parts
31/20	. . . . at least one insulator being rotatable about its own geometrical axis	33/12	. . . Auxiliary contacts on to which the arc is transferred from the main contacts (using arcing horns <a href="#">H01H 33/20</a> )
31/22	. . . wherein the contact or contacts are rectilinearly movable with respect to the carrying member	33/121	. . . . {Load break switches}
31/24	. . with rectilinearly-movable bridging contact	33/122	. . . . {both breaker and sectionaliser being enclosed, e.g. in SF <sub>6</sub> -filled container}
31/26	. with movable contact that remains electrically connected to one line in open position of switch	33/123	. . . . {in which the auxiliary contact pivots on the main contact-arm and performs a delayed and accelerated movement}
31/28	. . with angularly-movable contact	33/124	. . . . . {the auxiliary contact being a whip contact}
31/283	. . . {wherein the contact or contacts are rectilinearly movable with respect to the carrying member}	33/125	. . . . . {comprising a separate circuit breaker ( <a href="#">H01H 33/122</a> takes precedence)}
2031/286	. . . {wherein the contact is rotatable around its own longitudinal axis}	33/126	. . . . . {being operated by the distal end of a sectionalising contact arm}
31/30	. . . actuated through the movement of one or more insulators	33/127	. . . . . {movable with a sectionalising contact arm and operated by such movement}
31/32	. . with rectilinearly-movable contact	33/128	. . . . . {being operated by a separate mechanism interlocked with the sectionalising mechanism}
31/34	. with movable contact adapted to engage an overhead transmission line, e.g. for branching	33/14	. . . Multiple main contacts for the purpose of dividing the current through, or potential drop along, the arc
31/36	. . Contact moved by pantograph	33/143	. . . . {of different construction or type}
<b>33/00</b>	<b>High-tension or heavy-current switches with arc-extinguishing or arc-preventing means</b>	2033/146	. . . . {using capacitors, e.g. for the voltage division over the different switches}
33/002	. {Very heavy-current switches ( <a href="#">H01H 33/02</a> - <a href="#">H01H 33/98</a> take precedence)}	33/16	. . . Impedances connected with contacts
33/004	. . {making use of superconducting contacts (power cryotrons <a href="#">H01L 39/20</a> ; current limitation using superconducting elements <a href="#">H02H 9/023</a> )}	33/161	. . . . {Variable impedances}
33/006	. {adapted for interrupting fault currents with delayed zero crossings}	33/162	. . . . . {Liquid resistors}
33/008	. {Pedestal mounted switch gear combinations}	2033/163	. . . . . {using PTC elements}
33/02	. Details	33/164	. . . . {the impedance being inserted in the circuit by blowing the arc onto an auxiliary electrode}
		33/165	. . . . {Details concerning the impedances ( <a href="#">H01H 33/161</a> takes precedence)}
		33/166	. . . . {the impedance being inserted only while closing the switch}

33/167	. . . . {the impedance being inserted only while opening the switch}	33/555	. . . . {Protective arrangements responsive to abnormal fluid pressure, liquid level or liquid displacement, e.g. Buchholz relays (circuits <a href="#">H02H 5/08</a> ; specially adapted for transformers <a href="#">H01F 27/402</a> )}
33/168	. . . . {the impedance being inserted both while closing and while opening the switch}	33/56	. . . Gas reservoirs
33/18	. . . using blow-out magnet {(for vacuum switches <a href="#">H01H 33/664</a> ; pressure-generated arcs rotated by a magnetic field <a href="#">H01H 33/982</a> )}	33/561	. . . . {composed of different independent pressurised compartments put in communication only after their assemblage}
33/182	. . . . {using permanent magnets ( <a href="#">H01H 33/187</a> takes precedence)}	33/562	. . . . {Means for avoiding liquefaction or for disposing of liquefaction products}
33/185	. . . . {using magnetisable elements associated with the contacts ( <a href="#">H01H 33/187</a> takes precedence)}	33/563	. . . . {comprising means for monitoring the density of the insulating gas}
33/187	. . . . {comprising a hollow annular arc runner and a central contact between which a radially drawn arc rotates}	33/565	. . . . {Gas-tight sealings for moving parts penetrating into the reservoir}
33/20	. . . using arcing horns (using blow-out magnet <a href="#">H01H 33/18</a> ; arcing horns per se <a href="#">H01T 4/14</a> )	2033/566	. . . . {Avoiding the use of SF <sub>6</sub> }
33/22	. . . Selection of fluids for arc-extinguishing	2033/567	. . . . {Detection of decomposition products of the gas}
33/24	. . Means for preventing discharge to non-current-carrying parts, e.g. using corona ring	2033/568	. . . . {with overpressure release, e.g. rupture membranes}
33/245	. . . {using movable field electrodes}	33/57	. . . Recuperation of liquid or gas
33/26	. . Means for detecting the presence of an arc or other discharge	33/58	. . . Silencers for suppressing noise of switch operation
33/28	. . Power arrangements internal to the switch for operating the driving mechanism	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
33/285	. . . {using electro-dynamic repulsion (assisting the movement of pistons by accelerating coil <a href="#">H01H 33/882</a> )}	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> )}
33/30	. . . using fluid actuator	33/596	. . . {for interrupting dc}
33/302	. . . . {for fluid insulated switchgear, wherein the insulating fluid is also the working fluid}	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
33/304	. . . . {Working fluid supplies}	33/62	. . {wherein the break is in air at atmospheric pressure, e.g. in open air}
2033/306	. . . . {monitoring the pressure of the working fluid, e.g. for protection measures}	33/64	. . wherein the break is in gas (in air at atmospheric pressure <a href="#">H01H 33/62</a> ; vacuum switches <a href="#">H01H 33/66</a> )
2033/308	. . . . {comprising control and pilot valves}	33/66	. . Vacuum switches
33/32	. . . . pneumatic	33/6606	. . . {Terminal arrangements}
33/34	. . . . hydraulic	2033/6613	. . . . {Cooling arrangements directly associated with the terminal arrangements}
33/36	. . . using dynamo-electric motor (for storing energy in a spring motor <a href="#">H01H 33/40</a> )	33/662	. . . Housings or protective screens
33/38	. . . using electromagnet (for storing energy in a spring motor <a href="#">H01H 33/40</a> )	33/66207	. . . . {Specific housing details, e.g. sealing, soldering or brazing}
33/40	. . . using spring motor	2033/66215	. . . . . {Details relating to the soldering or brazing of vacuum switch housings}
33/42	. . Driving mechanisms	2033/66223	. . . . . {Details relating to the sealing of vacuum switch housings}
33/423	. . . {making use of an electromagnetic wave communication}	2033/6623	. . . . . {Details relating to the encasing or the outside layers of the vacuum switch housings}
2033/426	. . . {Details concerning the connection of the isolating driving rod to a metallic part}	33/66238	. . . . . {Specific bellows details}
33/44	. . Devices for ensuring operation of the switch at a predetermined point in the ac cycle (circuit arrangements <a href="#">H01H 33/59</a> )	2033/66246	. . . . . {Details relating to the guiding of the contact rod in vacuum switch bellows}
33/46	. . Interlocking mechanisms	2033/66253	. . . . . {Details relating to the prevention of unwanted rotation of the contact rod in vacuum switch bellows}
33/48	. . . for interlocking between casing or cover and mechanism for operating contacts	33/66261	. . . . . {Specific screen details, e.g. mounting, materials, multiple screens or specific electrical field considerations}
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 <a href="#">H02B 1/26</a> ); 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 <a href="#">H02B 11/08</a> )		

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}	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)}
2033/66292	. . . . .	{Details relating to the use of multiple screens in vacuum switches}	33/7076	. . . . .	{characterised by the use of special materials ( <a href="#">H01H 33/7023</a> - <a href="#">H01H 33/7069</a> take precedence)}
33/664	. . . . .	Contacts; Arc-extinguishing means, e.g. arcing rings	33/7084	. . . . .	{characterised by movable parts influencing the gas flow ( <a href="#">H01H 33/7023</a> - <a href="#">H01H 33/7076</a> take precedence)}
33/6641	. . . . .	{making use of a separate coil}	33/7092	. . . . .	{characterised by several arcing chambers in series ( <a href="#">H01H 33/7023</a> - <a href="#">H01H 33/7084</a> take precedence)}
33/6642	. . . . .	{having cup-shaped contacts, the cylindrical wall of which being provided with inclined slits to form a coil}	33/72	. . . . .	having stationary parts for directing the flow of arc-extinguishing fluid, e.g. arc-extinguishing chamber
33/6643	. . . . .	{having disc-shaped contacts subdivided in petal-like segments, e.g. by helical grooves}	33/73	. . . . .	wherein the break is in air at atmospheric pressure, e.g. in open air
33/6644	. . . . .	{having coil-like electrical connections between contact rod and the proper contact}	33/74	. . . . .	wherein the break is in gas ( <a href="#">in air at atmospheric pressure</a> <a href="#">H01H 33/73</a> )
33/6645	. . . . .	{in which the coil like electrical connections encircle at least once the contact rod}	33/75	. . . . .	Liquid-break switches, e.g. oil-break
33/6646	. . . . .	{having non flat disc-like contact surface}	33/76	. . . . .	wherein arc-extinguishing gas is evolved from stationary parts; Selection of material therefor
33/6647	. . . . .	{having fixed middle contact and two movable contacts}	33/765	. . . . .	{the gas-evolving material being incorporated in the contact material}
2033/6648	. . . . .	{Contacts containing flexible parts, e.g. to improve contact pressure}	33/77	. . . . .	wherein the break is in air at atmospheric pressure
33/666	. . . . .	Operating arrangements	33/78	. . . . .	wherein the break is in gas ( <a href="#">in air at atmospheric pressure</a> <a href="#">H01H 33/77</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)}	33/80	. . . . .	flow of arc-extinguishing fluid from a pressure source being controlled by a valve
33/6662	. . . . .	{using bistable electromagnetic actuators, e.g. linear polarised electromagnetic actuators}	33/82	. . . . .	the fluid being air or gas
33/6664	. . . . .	{with pivoting movable contact structure}	33/83	. . . . .	wherein the contacts are opened by the flow of air or gas
2033/6665	. . . . .	{Details concerning the mounting or supporting of the individual vacuum bottles}	33/84	. . . . .	the fluid being liquid, e.g. oil
2033/6667	. . . . .	{Details concerning lever type driving rod arrangements}	33/85	. . . . .	wherein the contacts are opened by the flow of liquid
2033/6668	. . . . .	{with a plurality of interruptible circuit paths in single vacuum chamber}	33/86	. . . . .	the flow of arc-extinguishing fluid under pressure from the contact space being controlled by a valve
33/668	. . . . .	Means for obtaining or monitoring the vacuum	33/88	. . . . .	the flow of arc-extinguishing fluid being produced or increased by movement of pistons or other pressure-producing parts
33/6683	. . . . .	{by gettering}	33/882	. . . . .	{the movement being assisted by accelerating coils}
2033/6686	. . . . .	{by emitting and receiving reflected sound or ultrasound signals}	33/884	. . . . .	{with variable-area piston}
33/68	. . . . .	Liquid-break switches, e.g. oil-break	33/886	. . . . .	{by movement of rotating pistons}
33/70	. . . . .	Switches with separate means for directing, obtaining, or increasing flow of arc-extinguishing fluid	2033/888	. . . . .	{Deflection of hot gasses and arcing products}
33/7007	. . . . .	{wherein the flow is a function of the current being interrupted}	33/90	. . . . .	this movement being effected by or in conjunction with the contact-operating mechanism
33/7015	. . . . .	{characterised by flow directing elements associated with contacts ( <a href="#">electrical or mechanical properties of the contact system</a> <a href="#">H01H 1/385</a> )}	33/901	. . . . .	{making use of the energy of the arc or an auxiliary arc}
33/7023	. . . . .	{characterised by an insulating tubular gas flow enhancing nozzle ( <a href="#">H01H 33/7038</a> takes precedence)}	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}
33/703	. . . . .	{having special gas flow directing elements, e.g. grooves, extensions}			
33/7038	. . . . .	{characterised by a conducting tubular gas flow enhancing nozzle}			
33/7046	. . . . .	{having special gas flow directing elements, e.g. grooves, extensions ( <a href="#">H01H 33/7053</a> takes precedence)}			



33/903	. . . . {and assisting the operating mechanism}	35/025	. . {the switch being discriminative in different directions}
33/904	. . . . {characterised by the transmission between operating mechanism and piston or movable contact}	35/027	. . {the inertia mass activating the switch mechanically, e.g. through a lever}
33/905	. . . . {the compression volume being formed by a movable cylinder and a semi-mobile piston}	35/06	. Switches operated by change of speed (operated by change of fluid flow <a href="#">H01H 35/24</a> )
2033/906	. . . . {with pressure limitation in the compression volume, e.g. by valves or bleeder openings}	35/10	. . Centrifugal switches (level of mercury displaced by centrifugal action <a href="#">H01H 29/26</a> )
2033/907	. . . . {using tandem pistons, e.g. several compression volumes being modified in conjunction or sequential}	35/12	. . operated by reversal of direction of movement
2033/908	. . . . {using valves for regulating communication between, e.g. arc space, hot volume, compression volume, surrounding volume}	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 <a href="#">H01H 29/002</a> )}
33/91	. . . . the arc-extinguishing fluid being air or gas	35/141	. . {Details}
2033/912	. . . . {Liquified gases, e.g. liquified SF <sub>6</sub> }	35/142	. . . {Damping means to avoid unwanted response}
33/92	. . . . the arc-extinguishing fluid being liquid, e.g. oil	35/143	. . . {Resetting means}
33/94	. . . this movement being effected solely due to the pressure caused by the arc itself or by an auxiliary arc {(H01H 33/903 takes precedence)}	35/144	. . {operated by vibration}
33/95	. . . . the arc-extinguishing fluid being air or gas	35/145	. . {operated by a particular acceleration-time function}
33/96	. . . . the arc-extinguishing fluid being liquid, e.g. oil	35/146	. . {operated by plastic deformation or rupture of structurally associated elements}
33/98	. . the flow of arc-extinguishing fluid being initiated by an auxiliary arc or a section of the arc, without any moving parts for producing or increasing the flow {(H01H 33/901 takes precedence)}	35/147	. . {the switch being of the reed switch type}
33/982	. . . {in which the pressure-generating arc is rotated by a magnetic field}	35/148	. . {making use of a rolamite sensor}
35/00	<b>Switches operated by change of a physical condition</b> (operated by change of magnetic or electric field <a href="#">H01H 36/00</a> ; thermally-actuated switches <a href="#">H01H 37/00</a> ; time switches <a href="#">H01H 43/00</a> ; relays <a href="#">H01H 45/00</a> - <a href="#">H01H 61/00</a> ; sensing elements for providing continuous conversion of a variable into mechanical displacement <a href="#">G01</a> )	35/18	. Switches operated by change of liquid level or of liquid density, e.g. float switch (wherein the liquid constitutes a contact of the switch <a href="#">H01H 29/00</a> ; by magnet carried on a float <a href="#">H01H 36/02</a> )
	<b>NOTE</b>	35/183	. . {making use of a thermal switch}
	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.	35/186	. . {making use of a cable suspended floater containing an inclination sensing switch}
35/003	. {Switches operated by other part of human body than hands (push-button switches <a href="#">H01H 13/16</a> ; slide switches <a href="#">H01H 15/20</a> ; cord switches <a href="#">H01H 17/10</a> ; other switches <a href="#">H01H 19/16</a> and <a href="#">H01H 21/26</a> )}	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 <a href="#">H01H 37/36</a> )
35/006	. {Switches operated by mechanical overload condition, e.g. transmitted force or torque becoming too high}	35/242	. . {operated by one particular pressure-time function}
35/02	. Switches operated by change of position, inclination or orientation of the switch itself in relation to gravitational field (tilting mercury container <a href="#">H01H 29/20</a> ; change of position due to change of liquid level <a href="#">H01H 35/18</a> ; {specially adapted for electromechanical clocks or watches <a href="#">G04C 3/002</a> })	35/245	. . {actuated by the deformation of a body of elastic material}
35/022	. . {the switch being of the reed switch type}	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 <a href="#">H01H 37/18</a> )}
		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}	37/04	. . Bases; Housings; Mountings ( <a href="#">H01H 37/5427 takes precedence</a> )
35/2692	. . . {comprising pneumatic snap-action}	37/043	. . . {Mountings on controlled apparatus}
35/28	. . . Compensation for variation of ambient pressure or temperature	2037/046	. . . {being soldered on the printed circuit to be protected}
35/30	. . . Means for transmitting pressure to pressure-responsive operating part, e.g. by capsule and capillary tube	37/06	. . . to facilitate replacement, e.g. cartridge housing
35/32	. . actuated by bellows	37/08	. . Indicators; Distinguishing marks
35/34	. . actuated by diaphragm	37/10	. . Compensation for variation of ambient temperature or pressure
35/343	. . . {by snap acting diaphragm}	37/12	. . Means for adjustment of "on" or "off" operating temperature
35/346	. . . {in which the movable contact is formed or directly supported by the diaphragm}	37/14	. . . by anticipatory electric heater
35/36	. . actuated by curled flexible tube, e.g. Bourdon tube	37/16	. . . by varying the proportion of input heat received by the thermal element, e.g. by displacement of a shield
35/38	. . actuated by piston and cylinder	37/18	. . . by varying bias on the thermal element due to a separate spring
35/40	. . actuated by devices allowing continual flow of fluid, e.g. vane	37/20	. . . by varying the position of the thermal element in relation to switch base or casing
35/405	. . . {the switch being of the reed switch type}	37/22	. . . by adjustment of a member transmitting motion from the thermal element to contacts or latch
35/42	. Switches operated by change of humidity	37/24	. . . by adjustment of position of the movable contact on its driving member
<b>36/00</b>	<b>Switches actuated by change of magnetic field or of electric field, e.g. by change of relative position of magnet and switch, by shielding {(specially adapted for electromechanical clocks or watches <a href="#">G04C 3/004</a>)}</b>	37/26	. . . by adjustment of abutment for "off" position of the movable contact
36/0006	. {Permanent magnet actuating reed switches ( <a href="#">H01H 35/147 takes precedence</a> )}	37/28	. . . by adjustment of the position of the fixed contact
36/0013	. . {characterised by the co-operation between reed switch and permanent magnet; Magnetic circuits}	37/30	. . . by varying the position of the contact unit in relation to switch base or casing
36/002	. . . {Actuation by moving ferromagnetic material, switch and magnet being fixed}	37/32	. . Thermally-sensitive members ( <a href="#">temperature responsive elements in general <a href="#">G01K</a></a> )
36/0026	. . . {comprising a biasing, helping or polarising magnet}	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> ; in general <a href="#">G01K 5/483</a> , <a href="#">G12B 1/00</a> ; for control of temperature <a href="#">G05D 23/024</a> )}
36/0033	. . {Mountings; Housings; Connections}	2037/326	. . . {with radiative heat transfer to the switch, e.g. special absorption surfaces}
36/004	. . {push-button-operated, e.g. for keyboards}	37/34	. . . Means for transmitting heat thereto, e.g. capsule remote from contact member
36/0046	. . {Limit switches, also fail-safe operation or anti-tamper considerations}	37/36	. . . actuated due to expansion or contraction of a fluid with or without vaporisation ( <a href="#">the fluid forming a contact of the switch <a href="#">H01H 29/04</a>, <a href="#">H01H 29/30</a></a> )
36/0053	. . {periodically operated}	37/38	. . . . with bellows
36/006	. . {comprising a plurality of reed switches, e.g. selectors or joystick-operated}	37/40	. . . . with diaphragm
36/0066	. . {magnet being removable, e.g. part of key pencil}	37/42	. . . . with curled flexible tube, e.g. Bourdon tube
36/0073	. {actuated by relative movement between two magnets}	37/44	. . . . with piston and cylinder
36/008	. {Change of magnetic field wherein the magnet and switch are fixed, e.g. by shielding or relative movements of armature ( <a href="#">for reed switches <a href="#">H01H 36/002</a></a> )}	37/46	. . . actuated due to expansion or contraction of a solid ( <a href="#">deflection of a bimetallic element <a href="#">H01H 37/52</a></a> )
2036/0086	. {Movable or fixed contacts formed by permanent magnets}	37/48	. . . . with extensible rigid rods or tubes
2036/0093	. {Micromechanical switches actuated by a change of the magnetic field}	37/50	. . . . with extensible wires under tension
36/02	. actuated by movement of a float carrying a magnet	37/52	. . . actuated due to deflection of bimetallic element
<b>37/00</b>	<b>Thermally-actuated switches (electrothermal relays operated by electrical input <a href="#">H01H 61/00</a>; protective switches with electrothermal release or actuation <a href="#">H01H 73/00</a> - <a href="#">H01H 83/00</a>)</b>	37/521	. . . . {comprising a plurality of bimetals acting in the same direction}
37/002	. {combined with protective means}	2037/523	. . . . {using a corrugated bimetal}
37/004	. {with thermal image}	2037/525	. . . . {Details of manufacturing of the bimetals, e.g. connection to non bimetallic elements or insulating coatings}
37/006	. {with different switches operated at substantially different temperatures}	2037/526	. . . . {Materials for bimetals}
2037/008	. {Micromechanical switches operated thermally}	2037/528	. . . . {the bimetallic element being composed of more than two layers}
37/02	. Details		

37/54	. . . . wherein the bimetallic element is inherently snap acting	37/766	. . . . {using a bridging contact}
37/5409	. . . . . {Bistable switches; Resetting means}	37/767	. . . {Normally open}
37/5418	. . . . . {using cantilevered bimetallic snap elements}	2037/768	. . . {characterised by the composition of the fusible material}
37/5427	. . . . . {encapsulated in sealed miniaturised housing}	2037/769	. . . {characterised by the composition of insulating fusible materials, e.g. for use in the thermal pellets}
37/5436	. . . . . {mounted on controlled apparatus}		
2037/5445	. . . . . {with measures for avoiding slow break of contacts during the creep phase of the snap bimetal}	<b>39/00</b>	<b>Switching devices actuated by an explosion produced within the device and initiated by an electric current</b>
2037/5454	. . . . . {with separate spring biasing the bimetal snap element against the heat transfer surface}	39/002	. {provided with a cartridge-magazine}
2037/5463	. . . . . {the bimetallic snap element forming part of switched circuit}	39/004	. {Closing switches}
2037/5472	. . . . . {having an omega form, e.g. the bimetallic snap element having a ring shape with a central tongue}	39/006	. {Opening by severing a conductor}
2037/5481	. . . . . {the bimetallic snap element being mounted on the contact spring}	2039/008	. {using the switch for a battery cutoff}
2037/549	. . . . . {Details of movement transmission between bimetallic snap element and contact}	<b>41/00</b>	<b>Switches providing a selected number of consecutive operations of the contacts by a single manual actuation of the operating part (for telephone communication H04M 1/26)</b>
37/56	. . . . having spirally wound or helically wound bimetallic element	41/04	. Switches without means for setting or mechanically storing a multidigit number
37/58	. . . actuated due to thermally controlled change of magnetic permeability	41/06	. . dial or slide operated
37/585	. . . . {the switch being of the reed switch type}	41/08	. . keyboard operated
37/60	. . Means for producing snap action (inherent in bimetallic element H01H 37/54; caused by a magnet H01H 37/66)	41/10	. Switches with means for setting or mechanically storing a multidigit number
37/62	. . Means other than thermal means for introducing a predetermined time delay	41/12	. . dial or slide operated
37/64	. . Contacts	41/14	. . keyboard operated
37/66	. . . Magnetic reinforcement of contact pressure; Magnet causing snap action	<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 operations after the programme is completed (clocks with attached or built-in means operating any device at preselected times or after preselected time-intervals G04C 23/00; {apparatus which can be set and started to measure-off predetermined intervals G04F 3/06}; programme-control systems G05B 19/00)</b>
37/68	. . . sealed in evacuated or gas-filled tube	43/005	. {with timing of the actuation of contacts due to a part rotating at variable speed}
37/70	. . . Resetting means {(H01H 37/5409 takes precedence)}	43/02	. Details
2037/705	. . . . {wherein the switch cannot be closed when the temperature is above a certain value}	43/022	. . {Bases; Housings; Mountings}
37/72	. Switches in which the opening movement and the closing movement of a contact are effected respectively by heating and cooling or <i>vice versa</i>	43/024	. . {Terminal arrangements (in general H01H 1/58)}
37/74	. Switches in which only the opening movement or only the closing movement of a contact is effected by heating or cooling (for the electrical protection of electric lines or electric apparatus H01H 73/00 - H01H 83/00)	43/026	. . {Contact arrangements}
37/76	. . Contact member actuated by melting of fusible material, actuated due to burning of combustible material or due to explosion of explosive material (fuses H01H 85/00)	43/028	. . {Means for manually actuating the contacts or interfering with the cooperation between timer mechanism and contacts}
37/761	. . . {with a fusible element forming part of the switched circuit (H01H 37/767 takes precedence)}	43/04	. . Means for time setting
2037/762	. . . . {using a spring for opening the circuit when the fusible element melts}	43/06	. . . comprising separately adjustable parts for each programme step, e.g. with tappets
2037/763	. . . . . {the spring being a blade spring}	43/065	. . . . {using cams or discs supporting a plurality of individually programmable elements (Schaltreiter)}
37/764	. . . {in which contacts are held closed by a thermal pellet}	43/08	. . . comprising an interchangeable programme part which is common for all programme steps, e.g. with a punched card
37/765	. . . . {using a sliding contact between a metallic cylindrical housing and a central electrode}	43/10	. with timing of actuation of contacts due to a part rotating at substantially constant speed
		43/101	. . {Driving mechanisms}
		43/102	. . . {using a pawl and ratchet wheel mechanism}
		43/103	. . {stopping automatically after one preselected time interval}
		43/104	. . . {by mechanical coupling device}
		43/105	. . . {by electromechanical coupling device}

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

**Relays**

<b>45/00</b>	<b>Details of relays</b> (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> ; testing of relays <a href="#">G01R 31/00</a> ; relays for emergency protective circuit arrangements <a href="#">H02H</a> )
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> )
45/04	. . Mounting complete relay or separate parts of relay on a base or inside a case
45/06	. . having windows; Transparent cases or covers
45/08	. Indicators; Distinguishing marks
45/10	. Electromagnetic or electrostatic shielding (casings <a href="#">H01H 45/02</a> ; screening in general <a href="#">H05K 9/00</a> )
45/12	. Ventilating; Cooling; Heating (for operating electrothermal relays <a href="#">H01H 61/013</a> )
45/14	. Terminal arrangements
<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> (circuit arrangements for electromagnets in general <a href="#">H01F 7/18</a> )
47/001	. {Functional circuits, e.g. logic, sequencing, interlocking circuits}
47/002	. {Monitoring or fail-safe circuits}
2047/003	. . {Detecting welded contacts and applying weld break pulses to coil}
47/004	. . {using plural redundant serial connected relay operated contacts in controlled circuit}
47/005	. . . {Safety control circuits therefor, e.g. chain of relays mutually monitoring each other}
2047/006	. . {Detecting unwanted movement of contacts and applying pulses to coil for restoring to normal status}
47/007	. {with galvanic isolation between controlling and controlled circuit, e.g. transformer relay}
2047/008	. {with a drop in current upon closure of armature or change of inductance}
2047/009	. {with self learning features, e.g. measuring the attracting current for a relay and memorising it}
47/02	. for modifying the operation of the relay
2047/025	. . {with taking into account of the thermal influences, e.g. change in resistivity of the coil or being adapted to high temperatures}
47/04	. . for holding armature in attracted position, e.g. when initial energising circuit is interrupted; for maintaining armature in attracted position, e.g. with reduced energising current {(with switching regulator <a href="#">H01H 47/325</a> )}
47/043	. . . {making use of an energy accumulator (for bistable relays <a href="#">H01H 47/226</a> )}
2047/046	. . . {with measuring of the magnetic field, e.g. of the magnetic flux, for the control of coil current}
47/06	. . . by changing number of serially-connected turns or windings
47/08	. . . by changing number of parallel-connected turns or windings
47/10	. . . by switching-in or -out impedance external to the relay winding
47/12	. . for biasing the electromagnet



47/14	. . for differential operation of the relay	2050/046	. . . . {Assembling parts of a relay by using snap mounting techniques}
47/16	. . for conjoint, e.g. additive, operation of the relay	50/047	. . . {Details concerning mounting a relays}
47/18	. . for introducing delay in the operation of the relay (short-circuited conducting sleeves, bands or discs <a href="#">H01H 50/46</a> )	50/048	. . . . {Plug-in mounting or sockets}
47/20	. . for producing frequency-selective operation of the relay	2050/049	. . . {Assembling or mounting multiple relays in one common housing}
47/22	. for supplying energising current for relay coil	50/06	. . having windows; Transparent cases or covers
47/223	. . {adapted to be supplied by AC}	50/08	. Indicators; Distinguishing marks
47/226	. . {for bistable relays}	50/10	. Electromagnetic or electrostatic shielding (casings <a href="#">H01H 50/02</a> ; screening in general <a href="#">H05K 9/00</a> )
47/24	. . having light-sensitive input	50/12	. Ventilating; Cooling; Heating (for operating electrothermal relays <a href="#">H01H 61/013</a> )
47/26	. . having thermo-sensitive input	50/14	. Terminal arrangements {(for coils <a href="#">H01H 50/443</a> )}
47/28	. . Energising current supplied by discharge tube	50/16	. Magnetic circuit arrangements (cores, yokes, or armatures in general <a href="#">H01F 3/00</a> ; magnets in general <a href="#">H01F 7/00</a> )
47/30	. . . by gas-filled discharge tube	50/163	. . {Details concerning air-gaps, e.g. anti-remanence, damping, anti-corrosion}
47/32	. . Energising current supplied by semiconductor device	2050/166	. . {wherein the magnetic circuit parts are molded in a magnetic plastic material}
47/325	. . . {by switching regulator}	50/18	. . Movable parts of magnetic circuits, e.g. armature
47/34	. . Energising current supplied by magnetic amplifier {(magnetic amplifiers <a href="#">H03F 9/00</a> )}	50/20	. . . movable inside coil and substantially lengthwise with respect to axis thereof; movable coaxially with respect to coil
47/36	. . Relay coil or coils forming part of a bridge circuit	50/22	. . . . wherein the magnetic circuit is substantially closed
<b>49/00</b>	<b>Apparatus or processes specially adapted to the manufacture of relays or parts thereof</b>	2050/225	. . . . . {with yoke and armature formed by identical stacked laminates, e.g. punched in one and the same tool}
<b>50/00</b>	<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 select or switches <a href="#">H01H 63/00</a>; {testing of relays <a href="#">G01R 31/00</a>; electromagnets in general <a href="#">H01F 7/06</a>; relays for emergency protective circuit arrangements <a href="#">H02H</a>)}</b>	50/24	. . . Parts rotatable or rockable outside coil
50/002	. {particular to three-phase electromagnetic relays (synchronous switching <a href="#">H01H 9/563</a> )}	50/26	. . . . Parts movable about a knife edge
50/005	. {using micromechanics}	50/28	. . . . Parts movable due to bending of a blade spring or reed
2050/007	. . {Relays of the polarised type, e.g. the MEMS relay beam having a preferential magnetisation direction}	50/30	. . . Mechanical arrangements for preventing or damping vibration or shock, e.g. by balancing of armature
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> )	50/305	. . . . {damping vibration due to functional movement of armature (in air-gap <a href="#">H01H 50/163</a> )}
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> )}	50/32	. . . Latching movable parts mechanically
50/023	. . {Details concerning sealing, e.g. sealing casing with resin (in general <a href="#">H01H 9/04</a> )}	50/321	. . . . {the mechanical latch being controlled directly by the magnetic flux or part of it}
2050/025	. . . {containing inert or dielectric gasses, e.g. SF <sub>6</sub> , for arc prevention or arc extinction}	50/323	. . . . {for interlocking two or more relays (in general <a href="#">H01H 9/26</a> )}
50/026	. . {Details concerning isolation between driving and switching circuit}	2050/325	. . . . . {Combined electrical and mechanical interlocking, e.g. usually for auxiliary contacts}
2050/028	. . {Means to improve the overall withstanding voltage, e.g. creepage distances}	50/326	. . . . . {with manual intervention, e.g. for testing, resetting or mode selection}
50/04	. . Mounting complete relay or separate parts of relay on a base or inside a case	2050/328	. . . . . {with manual locking means having three positions, e.g. on-off-automatic}
50/041	. . . {Details concerning assembly of relays}	50/34	. . . Means for adjusting limits of movement; Mechanical means for adjusting returning force
50/042	. . . . {Different parts are assembled by insertion without extra mounting facilities like screws, in an isolated mounting part, e.g. stack mounting on a coil-support}	50/36	. . Stationary parts of magnetic circuit, e.g. yoke
50/043	. . . . {Details particular to miniaturised relays ( <a href="#">H01H 50/042</a> takes precedence)}	2050/362	. . . {Part of the magnetic circuit conducts current to be switched or coil current, e.g. connector and magnetic circuit formed of one single part}
2050/044	. . . . . {Special measures to minimise the height of the relay}	2050/365	. . . {formed from a single sheet of magnetic material by punching, bending, plying}
50/045	. . . . . {Details particular to contactors ( <a href="#">H01H 50/042</a> takes precedence)}	2050/367	. . . {Methods for joining separate core and L-shaped yoke}
		50/38	. . . Part of main magnetic circuit shaped to suppress arcing between the contacts of the relay

- 50/40 . . . Branched or multiple-limb main magnetic circuits
- 50/42 . . . Auxiliary magnetic circuits, e.g. for maintaining armature in, or returning armature to, position of rest, for damping or accelerating movement
- 50/44 . Magnetic coils or winding ([circuit arrangements H01H 47/00](#); in general [H01F 5/00](#))
- 50/443 . . {Connections to coils}
- 2050/446 . . {Details of the insulating support of the coil, e.g. spool, bobbin, former}
- 50/46 . . Short-circuited conducting sleeves, bands, or discs {(for electromagnets [H01F 7/1205](#))}
- 50/54 . Contact arrangements ([contacts for switches in general H01H 1/00](#))
- 50/541 . . {Auxiliary contact devices (in general [H01H 9/0066](#))}
- 50/543 . . . {Auxiliary switch inserting resistor during closure of contactor}
- 50/545 . . . {Self-contained, easily replaceable microswitches}
- 50/546 . . {for contactors having bridging contacts}
- 50/548 . . {for miniaturised relays}
- 50/56 . . Contact spring sets
- 50/58 . . . Driving arrangements structurally associated therewith; Mounting of driving arrangements on armature
- 50/60 . . moving contact being rigidly combined with movable part of magnetic circuit {(for polarised relays [H01H 51/2254](#), [H01H 51/2281](#))}
- 50/62 . . Co-operating movable contacts operated by separate electrical actuating means
- 50/64 . Driving arrangements between movable part of magnetic circuit and contact ([structurally associated with contact spring sets H01H 50/58](#))
- 50/641 . . {intermediate part performing a rectilinear movement ([H01H 50/645](#), [H01H 50/66](#) - [H01H 50/74](#) take precedence)}
- 50/642 . . . {intermediate part being generally a slide plate, e.g. a card}
- 50/643 . . {intermediate part performing a rotating or pivoting movement ([H01H 50/645](#), [H01H 50/66](#) - [H01H 50/74](#) take precedence)}
- 50/644 . . . {having more than one rotating or pivoting part}
- 50/645 . . {intermediate part making a resilient or flexible connection ([H01H 50/66](#) - [H01H 50/74](#) take precedence)}
- 50/646 . . . {intermediate part being a blade spring}
- 50/647 . . {intermediate part comprising interlocking means for different contact pairs ([H01H 50/66](#) - [H01H 50/74](#) take precedence; for two separate relays [H01H 50/323](#); for ratchets [H01H 51/08](#))}
- 50/648 . . {intermediate part being rigidly combined with armature ([H01H 50/66](#) - [H01H 50/74](#) take precedence)}
- 50/66 . . with lost motion
- 50/68 . . with snap action
- 50/70 . . operating contact momentarily during stroke of armature
- 50/72 . . for mercury contact
- 50/74 . . Mechanical means for producing a desired natural frequency of operation of the contacts, e.g. for self-interrupter
- 50/76 . . . using reed or blade spring
- 50/78 . . . using diaphragm; using stretched wire or ribbon vibrating sideways
- 50/80 . . . using torsionally-vibrating member, e.g. wire, strip
- 50/82 . . . using spring-loaded pivoted inertia member
- 50/84 . . . with means for adjustment of frequency or of make-to-break ratio
- 50/86 . Means for introducing a predetermined time delay between the initiation of the switching operation and the opening or closing of the contacts ([circuit arrangements for introducing delay H01H 47/18](#); short-circuited conducting sleeves, bands, or discs [H01H 50/46](#))
- 50/88 . . Mechanical means, e.g. dash-pot
- 50/90 . . . the delay effective in both directions of operation
- 50/92 . . Thermal means ([inherent in electrothermal relays H01H 61/00](#))
- 51/00 Electromagnetic relays (relays using the dynamo-electric effect [H01H 53/00](#))**
- 51/005 . {Inversing contactors ([H01H 50/323](#) takes precedence)}
- 51/01 . Relays in which the armature is maintained in one position by a permanent magnet and freed by energisation of a coil producing an opposing magnetic field {([H01H 51/02](#) - [H01H 51/26](#) take precedence)}
- 51/02 . Non-polarised relays
- 51/04 . . with single armature; with single set of ganged armatures
- 51/06 . . . Armature is movable between two limit positions of rest and is moved in one direction due to energisation of an electromagnet and after the electromagnet is de-energised is returned by energy stored during the movement in the first direction, e.g. by using a spring, by using a permanent magnet, by gravity {(motors with armature moved one way and returned by spring in general [H02K 33/02](#))}
- 51/065 . . . . {Relays having a pair of normally open contacts rigidly fixed to a magnetic core movable along the axis of a solenoid, e.g. relays for starting automobiles ([details H01H 50/20](#))}
- 51/08 . . . . Contacts alternately opened and closed by successive cycles of energisation and de-energisation of the electromagnet, e.g. by use of a ratchet
- 51/082 . . . . . {using rotating ratchet mechanism}
- 51/084 . . . . . {with axial ratchet elements}
- 51/086 . . . . . {with radial ratchet elements}
- 51/088 . . . . . {moved alternately in opposite directions}
- 51/10 . . . . Contacts retained open or closed by a latch which is controlled by an electromagnet

51/12	. . . Armature is movable between two limit positions of rest and is moved in both directions due to the energisation of one or the other of two electromagnets without the storage of energy to effect the return movement { (motors with armature moved one way and returned by spring in general <a href="#">H02K 33/02</a> ) }	51/32	. . Frequency relays; Mechanically-tuned relays { (switched devices for electric time devices <a href="#">G04C</a> ; electromechanical resonators <a href="#">H03H 9/00</a> ; telegraph circuits with oscillating relay <a href="#">H04L 25/205</a> ; mechanical means for producing a desired natural frequency of operation of the contacts <a href="#">H01H 50/74</a> ) }
51/14	. . . . without intermediate neutral position of rest	51/34	. Self-interrupters, i.e. with periodic or other repetitive opening and closing of contacts
51/16	. . . . with intermediate neutral position of rest	51/36	. . wherein the make-to-break ratio is varied by hand setting or current strength
51/18	. . . Armature is rotatable through an unlimited number of revolutions		
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 51/28</a> takes precedence) }	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</a> takes precedence) }	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</a> takes precedence) }	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 { (parts of protective circuit arrangements <a href="#">H02H 1/00</a> ) }
51/2263	. . {comprising rotatable armature, rotating around central axis perpendicular to the main plane of the armature ( <a href="#">H01H 51/2227</a> takes precedence) }	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</a> takes precedence) }	53/14	. Contacts actuated by an electric motor through fluid-pressure transmission, e.g. using a motor-driven pump { (switches using dynamo-electric motor <a href="#">H01H 3/26</a> ) }
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; Piezo-electric 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>
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</a> takes precedence)		{ (electrostatic measuring instruments <a href="#">G01R 5/28</a> ); clutches in general using the Johnson-Rahbek effect <a href="#">H02N 13/00</a> ; {electrostatic transducers <a href="#">H04R 19/00</a> ; systems for preventing the formation of electrostatic charges <a href="#">H05F</a> ) }
51/281	. . {Mounting of the relay; Encapsulating; Details of connections}	59/0009	. {making use of micromechanics}
51/282	. . {Constructional details not covered by <a href="#">H01H 51/281</a> }	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}
51/284	. . {Polarised relays (polarised relays in general <a href="#">H01H 51/22</a> ) }	2059/0027	. . {Movable electrode connected to ground in the open position, for improving isolation}
51/285	. . . {for latching of contacts}	2059/0036	. . {Movable armature with higher resonant frequency for faster switching}
51/287	. . {Details of the shape of the contact springs}	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}
51/288	. . {Freely suspended contacts}		
51/29	. Relays having armature, contacts, and operating coil within a sealed casing ( <a href="#">H01H 51/27</a> takes precedence)		
51/30	. specially adapted for actuation by alternating current		

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 (in general <a href="#">H01H 37/323</a> )}	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 (details thereof <a href="#">H01H 63/00</a>; selecting in general <a href="#">H04Q</a>)</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 (details of relays <a href="#">H01H 45/00</a>)</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		
63/20	. . . using stepping magnet and ratchet		



**Emergency protective devices**

<b>69/00</b>	<b>Apparatus or processes for the manufacture of emergency protective devices</b> (manufacture of switches in general <a href="#">H01H 11/00</a> ; manufacture of relays in general <a href="#">H01H 49/00</a> )	71/04	Means for indicating condition of the switching device {(by means of an auxiliary contact <a href="#">H01H 71/46</a> )}
69/01	for calibrating or setting of devices to function under predetermined conditions (measuring electric values <a href="#">G01R</a> )	2071/042	{with different indications for different conditions, e.g. contact position, overload, short circuit or earth leakage}
2069/013	{with calibrating screws in trip bar}	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}
2069/016	{with single separate parts mountable or insertable in different orientations or positions, e.g. to obtain desired trip conditions}	2071/046	{exclusively by position of operating part, e.g. with additional labels or marks but no other movable indicators}
69/02	Manufacture of fuses	2071/048	{containing non-mechanical switch position sensor, e.g. HALL sensor}
69/022	{of printed circuit fuses}	71/06	Distinguishing marks, e.g. colour coding
2069/025	{using lasers}	71/08	Terminals; Connections (in general <a href="#">H01R</a> )
2069/027	{using ultrasonic techniques}	71/082	{Connections between juxtaposed circuit breakers}
<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>	2071/084	{specially adapted for avoiding decalibration of trip unit, e.g. bimetal, when fixing conductor wire to connector}
71/002	{with provision for switching the neutral conductor}	2071/086	{Low power connections for auxiliary switches, e.g. shunt trip}
2071/004	{with a tripping or current sensing device in the neutral wire, e.g. for third harmonics in a three phase system}	2071/088	{Terminals for switching devices which make the devices interchangeable, e.g. with fuses}
2071/006	{Provisions for user interfaces for electrical protection devices}	71/10	Operating or release mechanisms
2071/008	{Protective switches or relays using micromechanics}	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> )}
71/02	Housings; Casings; Bases; Mountings	71/1018	{with only external interconnections}
71/0207	{Mounting or assembling the different parts of the circuit breaker}	71/1027	{comprising a bidirectional connecting member actuated by the opening movement of one pole to trip a neighbour pole}
71/0214	{Housing or casing lateral walls containing guiding grooves or special mounting facilities ( <a href="#">H01H 71/0221</a> takes precedence)}	2071/1036	{having provisions for four or more poles}
71/0221	{Majority of parts mounted on central frame or wall}	71/1045	{Multiple circuits-breaker, e.g. for the purpose of dividing current or potential drop}
71/0228	{having provisions for interchangeable or replaceable parts}	71/1054	{Means for avoiding unauthorised release}
71/0235	{Contacts and the arc extinguishing space inside individual separate cases, which are positioned inside the housing of the circuit breaker (cassettes for rotating bridges see <a href="#">H01H 1/2058</a> )}	2071/1063	{making use of an equilibrating mass}
2071/0242	{Assembling parts of a circuit breaker by using snap mounting techniques}	71/1072	{Release mechanisms which are reset by opening movement of contacts}
71/025	{Constructional details of housings or casings not concerning the mounting or assembly of the different internal parts}	71/1081	{Modifications for selective or back-up protection; Correlation between feeder and branch circuit breaker (circuits <a href="#">H02H 3/06</a> , <a href="#">H02H 7/26</a> )}
71/0257	{Strength considerations}	2071/109	{with provisions for selecting between automatic or manual reset}
71/0264	{Mountings or coverplates for complete assembled circuit breakers, e.g. snap mounting in panel}	71/12	Automatic release mechanisms with or without manual release
71/0271	{Mounting several complete assembled circuit breakers together (interconnected mechanisms <a href="#">H01H 71/1009</a> )}	71/121	{Protection of release mechanisms (with auxiliary contact <a href="#">H01H 71/48</a> )}
2071/0278	{with at least one of juxtaposed casings dedicated to an auxiliary device, e.g. for undervoltage or shunt trip}	71/122	{actuated by blowing of a fuse}
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}	71/123	{using a solid-state trip unit (circuits <a href="#">H02H</a> )}
2071/0292	{Housing or frames containing grooves or slots for guiding movable parts}	2071/124	{with a hybrid structure, the solid state trip device being combined with a thermal or a electromagnetic trip}
		71/125	{characterised by sensing elements, e.g. current transformers (for differential protection <a href="#">H01H 83/144</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 (two similar push buttons for closing or resetting and opening or tripping <a href="#">H01H 71/58</a> ; test switches for earth fault circuit breakers <a href="#">H01H 83/04</a> )}	71/30	. . . . having additional short-circuited winding
71/14	. . . Electrothermal mechanisms {(combined with a electro-thermal time delay relay <a href="#">H01H 61/002</a> )}	71/32	. . . . having permanently magnetised part
71/142	. . . . {actuated due to change of magnetic permeability}	71/321	. . . . . {characterised by the magnetic circuit or active magnetic elements}
71/145	. . . . {using shape memory materials ( <a href="#">H01H 71/16</a> takes precedence; in general <a href="#">H01H 37/323</a> )}	71/322	. . . . . {with plunger type armature}
2071/147	. . . . {Thermal release by expansion of a fluid}	71/323	. . . . . {with rotatable armature}
71/16	. . . . with bimetal element {(combined with detection of imbalance of two or more currents <a href="#">H01H 83/223</a> )}	71/325	. . . . . {Housings, assembly or disposition of different elements in the housing}
71/161	. . . . . {with helically or spirally wound bimetal}	71/326	. . . . . {Sealed housings}
71/162	. . . . . {with compensation for ambient temperature}	71/327	. . . . . {Manufacturing or calibrating methods, e.g. air gap treatments}
71/164	. . . . . {Heating elements}	2071/328	. . . . . {using a spring for having minimal force on armature while maximal force on trip pin}
2071/165	. . . . . {the bimetal being inductively heated, e.g. load current does not pass through bimetal}	71/34	. . . . having two or more armatures controlled by a common winding
2071/167	. . . . . {Multiple bimetals working in parallel together, e.g. laminated together}	71/345	. . . . . {having a delayed movable core and a movable armature}
2071/168	. . . . . {Provisions for avoiding permanent deformation and thus decalibration of bimetal, e.g. due to overheating or action of a magnet}	71/36	. . . . frequency selective
71/18	. . . . with expanding rod, strip, or wire	71/38	. . . . wherein the magnet coil also acts as arc blow-out device
71/20	. . . . with fusible mass	71/40	. . . Combined electrothermal and electromagnetic mechanisms
71/205	. . . . . {using a ratchet wheel kept against rotation by solder}	71/402	. . . . {in which the thermal mechanism influences the magnetic circuit of the electromagnetic mechanism}
71/22	. . . . with compensation for variation of ambient temperature {(H01H 71/162 takes precedence)}	71/405	. . . . {in which a bimetal forms the inductor for the electromagnetic mechanism}
71/24	. . . Electromagnetic mechanisms	2071/407	. . . . {the thermal element being heated by the coil of the electromagnetic mechanism}
71/2409	. . . . {combined with an electromagnetic current limiting mechanism}	71/42	. . . Induction-motor, induced-current, or electrodynamic release mechanisms
71/2418	. . . . {combined with an electrodynamic current limiting mechanism}	71/43	. . . . Electrodynamic release mechanisms
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}	71/44	. . . 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> )
71/2436	. . . . {with a holding and a releasing magnet, the holding force being limited due to saturation of the holding magnet}	71/443	. . . . {with dash-pot}
71/2445	. . . . {using a reed switch (reed switches in general <a href="#">H01H 51/28</a> ; for current measuring <a href="#">G01R 19/16509</a> )}	71/446	. . . . {making use of an inertia mass}
71/2454	. . . . {characterised by the magnetic circuit or active magnetic elements}	71/46	. . . having means for operating auxiliary contacts additional to the main contacts
71/2463	. . . . {with plunger type armatures}	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> )}
71/2472	. . . . {with rotatable armatures}	71/465	. . . . {Self-contained, easily replaceable microswitches}
71/2481	. . . . {characterised by the coil design}	2071/467	. . . . {with history indication, e.g. of trip and/or kind of trip, number of short circuits etc.}
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}	71/48	. . . . with provision for short-circuiting the electrical input to the release mechanism after release of the switch, e.g. for protection of heating wire
71/26	. . . . with windings acting in opposition {(H01H 71/2436 takes precedence)}	71/50	. . Manual reset mechanisms {which may be also used for manual release}
71/28	. . . . with windings acting in conjunction	71/501	. . . {Means for breaking welded contacts; Indicating contact welding or other malfunction of the circuit breaker}
		2071/502	. . . . {with direct contact between manual operator and welded contact structure}
		71/503	. . . {Means for increasing the opening stroke of the contacts}
		71/504	. . . {provided with anti-rebound means (for switches in general <a href="#">H01H 1/50</a> )}

71/505	. . . {Latching devices between operating and release mechanism}	71/7436	. . . {Adjusting the position (or prestrain) of the bimetal ( <a href="#">H01H 71/7445</a> takes precedence)}
2071/506	. . . . {using balls or rollers in the latching device}	71/7445	. . . {Poly-phase adjustment}
2071/507	. . . . {being collapsible, e.g. yielding elastically, when the opening force is higher than a predetermined value}	2071/7454	. . . {with adjustable axis of transmission lever between bimetal element and trip lever}
2071/508	. . . . {with serial latches, e.g. primary latch latched by secondary latch for requiring a smaller trip force}	71/7463	. . {Adjusting only the electromagnetic mechanism}
71/52	. . . actuated by lever	2071/7472	. . {with antitamper means for avoiding unauthorised setting}
71/521	. . . . {Details concerning the lever handle}	2071/7481	. . {with indexing means for magnetic or thermal tripping adjustment knob}
71/522	. . . . {comprising a cradle-mechanism}	2071/749	. . {with a shunt element connected in parallel to magnetic or thermal trip elements, e.g. for adjusting trip current}
71/523	. . . . . {the contact arm being pivoted on cradle and mechanism spring acting between handle and contact arm}		
71/524	. . . . . {the contact arm being pivoted on handle and mechanism spring acting between cradle and contact arm}	<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>
71/525	. . . . . {comprising a toggle between cradle and contact arm and mechanism spring acting between handle and toggle knee}	73/02	. Details
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}	73/04	. . Contacts
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}	73/045	. . . {Bridging contacts (specific details for the contacting bridge per se <a href="#">H01H 1/20</a> and subgroups, e.g. rotating bridge <a href="#">H01H 1/2041</a> )}
71/528	. . . . . {comprising a toggle or collapsible link between handle and contact arm, e.g. sear pin mechanism}	73/06	. . Housings; Casings; Bases; Mountings
71/529	. . . . . {comprising an electroresponsive element forming part of the transmission chain between handle and contact arm}	73/08	. . . Plug-in housings {(for a plurality of juxtaposed housings <a href="#">H02B 1/056</a> )}
71/54	. . . actuated by tumbler	73/10	. . . Cartridge housings, e.g. screw-in housing
71/56	. . . actuated by rotatable knob or wheel	73/12	. . Means for indicating condition of the switch {(by means of an auxiliary contact <a href="#">H01H 71/46</a> )}
2071/565	. . . . {using a add on unit, e.g. a separate rotary actuator unit, mounted on lever actuated circuit breakers}	73/14	. . . Indicating lamp structurally associated with the switch
71/58	. . . actuated by push-button, pull-knob, or slide	73/16	. . Distinguishing marks, e.g. colour coding
71/60	. . . actuated by closure of switch casing	73/18	. . Means for extinguishing or suppressing arc {(in general <a href="#">H01H 9/30</a> - <a href="#">H01H 9/46</a> ; magnet coil acting as blow-out device <a href="#">H01H 71/38</a> )}
71/62	. . . with means for preventing resetting while abnormal condition persists, e.g. loose handle arrangement	73/20	. . Terminals; Connections (in general <a href="#">H01R</a> )
71/64	. . . . incorporating toggle linkage	73/22	. having electrothermal release and no other automatic release (cartridge type <a href="#">H01H 73/62</a> )
71/66	. . Power reset mechanisms	73/24	. . reset by lever
2071/665	. . . {the reset mechanism operating directly on the normal manual operator, e.g. electromagnet pushes manual release lever back into "ON" position}	73/26	. . reset by tumbler
71/68	. . . actuated by electromagnet	73/28	. . reset by rotatable knob or wheel
71/685	. . . . {in which the excitation of the electromagnet is interrupted by abnormal conditions}	73/30	. . reset by push-button, pull-knob or slide
71/70	. . . actuated by electric motor	73/303	. . . {with an insulating body insertable between the contacts when released by a bimetal element}
71/72	. . . actuated automatically a limited number of times	73/306	. . . {the push-button supporting pivotally a combined contact-latch lever}
71/74	. Means for adjusting the conditions under which the device will function to provide protection	73/32	. . reset by closure of switch casing
71/7409	. . {Interchangeable elements}	73/34	. . reset action requiring replacement or reconditioning of a fusible or explosive part
71/7418	. . {Adjusting both electrothermal and electromagnetic mechanism}	73/36	. having electromagnetic release and no other automatic release (cartridge type <a href="#">H01H 73/64</a> )
71/7427	. . {Adjusting only the electrothermal mechanism}	73/38	. . reset by lever
		73/40	. . reset by tumbler
		73/42	. . reset by rotatable knob or wheel
		73/44	. . reset by push-button, pull-knob or slide
		73/46	. . reset by closure of switch casing
		73/48	. having both electrothermal and electromagnetic automatic release (cartridge type <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	83/02	. operated by earth fault currents ( <a href="#">H01H 83/14 takes precedence</a> )
73/64	. . having only electromagnetic release	83/04	. . with testing means for indicating the ability of the switch or relay to function properly
73/66	. . having combined electrothermal and electromagnetic release	2083/045	. . . {Auxiliary switch opening testing circuit in synchronism with the main circuit}
<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>	83/06	. operated by current falling below a predetermined value
75/02	. Details	83/08	. operated by reversal of dc
75/04	. . Reset mechanisms for automatically reclosing a limited number of times ( <a href="#">circuit arrangements H02H 3/06</a> )	83/10	. operated by excess voltage, e.g. for lightning protection
75/06	. . . effecting one reclosing action only	83/12	. operated by voltage falling below a predetermined value, e.g. for no-volt protection
75/08	. having only electrothermal release	83/14	. operated by unbalance of two or more currents or voltages, e.g. for differential protection
75/10	. having only electromagnetic release	83/142	. . {with bimetal elements}
75/12	. having combined electrothermal and electromagnetic release	83/144	. . {with differential transformer}
<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>	2083/146	. . . {Provisions for avoiding disadvantages of having asymmetrical primaries, e.g. induction of a magnetic field even by zero difference current}
77/02	. in which the excess current itself provides the energy for opening the contacts, and having a separate reset mechanism	2083/148	. . . {with primary windings formed of rigid copper conductors}
2077/025	. . {with pneumatic means, e.g. by arc pressure}	83/16	. operated by abnormal ratio of voltage and current, e.g. distance relay
77/04	. . with electrothermal opening	83/18	. operated by abnormal product of, or abnormal phase angle between, voltage and current, e.g. directional relay
77/06	. . with electromagnetic opening {(combined with electromagnetic release mechanism <a href="#">H01H 71/2409</a> )}	83/20	. operated by excess current as well as by some other abnormal electrical condition
77/08	. . . retained closed by permanent or remanent magnetism and opened by windings acting in opposition	2083/201	. . {the other abnormal electrical condition being an arc fault}
77/10	. . with electrodynamic opening {(combined with electromagnetic release mechanism <a href="#">H01H 71/2418</a> )}	2083/203	. . {with shunt trip circuits, e.g. NC contact in an undervoltage coil circuit}
77/101	. . . {with increasing of contact pressure by electrodynamic forces before opening}	2083/205	. . {having shunt or UVR tripping device with integrated mechanical energy accumulator}
77/102	. . . {characterised by special mounting of contact arm, allowing blow-off movement}	2083/206	. . {with thermal shunt trip}
77/104	. . . . {with a stable blow-off position}	2083/208	. . {Converting under voltage release [UVR] and shunt release}
77/105	. . . . {whereby the blow-off movement unlatches the contact from a contact holder}	83/22	. . the other condition being unbalance of two or more currents or voltages
77/107	. . . {characterised by the blow-off force generating means, e.g. current loops}	83/223	. . . {with bimetal elements}
77/108	. . . . {comprising magnetisable elements, e.g. flux concentrator, linear slot motor}	83/226	. . . {with differential transformer}
<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>	<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 (switches actuated by melting of fusible material <a href="#">H01H 37/76</a>; automatic release of protective switches due to fusion of a mass <a href="#">H01H 73/00</a> - <a href="#">H01H 83/00</a>; disposition or arrangement of fuses on boards <a href="#">H02B 1/18</a>)</b>
<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>	2085/0004	. {making use of shape-memory material}
81/02	. electrothermally operated	2085/0008	. {making use of heat shrinkable material}
81/04	. electromagnetically operated	85/0013	. {Means for preventing damage, e.g. by ambient influences to the fuse}
<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>	85/0017	. . {due to vibration or other mechanical forces, e.g. centrifugal forces}
		85/0021	. . {water or dustproof devices}
		85/0026	. . . {casings for the fuse and its base contacts}
		85/003	. . . {casings for the fusible element}
		2085/0034	. . . {with molded casings}



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

85/2035	. . . . {for miniature fuses with parallel side contacts}	2085/386	. . . {with magnetic or electrodynamic arc-blowing}
85/204	. . . . {for low voltage fuses with knife-blade end contacts}	2085/388	. . . {using special materials}
85/2045	. . . {Mounting means or insulating parts of the base, e.g. covers, casings}	85/40	. . . using an arc-extinguishing liquid ( <a href="#">characterised by the composition of the liquid H01H 33/22</a> )
85/205	. . . {Electric connections to contacts on the base}	85/42	. . . using an arc-extinguishing gas ( <a href="#">characterised by the composition of the gas H01H 33/22</a> )
2085/2055	. . . . {Connections to bus bars in an installation with screw in type fuses or knife blade fuses}	85/43	. . Means for exhausting or absorbing gases liberated by fusing arc, or for ventilating excess pressure generated by heating
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}	85/44	. . Structural association with a spark-gap arrester
2085/2065	. . . {with base contacts adapted or adaptable to fuses of different lengths; bases with self-aligning contacts; intermediate adaptation pieces}	85/46	. . Circuit arrangements not adapted to a particular application of the protective device
2085/207	. . . {Bases adapted to fuses with different end contacts or to other components, e.g. circuit breakers; intermediate adaptation pieces}	85/463	. . . {with printed circuit fuse}
2085/2075	. . . {Junction box, having holders integrated with several other holders in a particular wiring layout}	2085/466	. . . {with remote controlled forced fusing}
2085/208	. . . . {specially adapted for vehicles}	85/47	. . Means for cooling
2085/2085	. . . {Holders for mounting a fuse on a printed circuit}	85/48	. Protective devices wherein the fuse is carried or held directly by the base
2085/209	. . . {Modular assembly of fuses or holders, e.g. side by side; combination of a plurality of identical fuse units}	85/485	. . {the fuse being provided with bayonet-type locking means}
2085/2095	. . . {Triangular setup of fuses, e.g. for space saving}	85/50	. . the fuse having contacts at opposite ends for co-operation with the base
85/22	. . Intermediate or auxiliary parts for carrying, holding, or retaining fuse, cooperating with base or fixed holder, and removable therefrom for renewing the fuse	85/52	. . the fuse being adapted for screwing into the base
85/24	. . Means for preventing insertion of incorrect fuse	85/54	. Protecting devices wherein the fuse is carried, held or retained by an intermediate or auxiliary part removable from the base, or used as sectionalisers
85/25	. . Safety arrangements preventing or inhibiting contact with live parts, including operation of isolation on removal of cover ( <a href="#">interlocking between casing or protective shutter of a switch and mechanism for operating its contacts H01H 9/22</a> )	85/542	. . {the intermediate or auxiliary part being provided with bayonet-type locking means}
85/26	. . Magazine arrangements	85/545	. . {with pivoting fuse carrier ( <a href="#">tumbler switch with built-in fuse H01H 23/10</a> )}
85/263	. . . {with spare printed circuit fuse}	85/547	. . {with sliding fuse carrier}
2085/266	. . . {with replacement of a fuse which is part of a printed circuit}	85/56	. . the intermediate or auxiliary part having side contacts for plugging into the base, e.g. bridge-carrier type
85/28	. . . effecting automatic replacement	85/58	. . . with intermediate or auxiliary part and base shaped to interfit and thereby enclose the fuse
85/30	. . Means for indicating condition of fuse structurally associated with the fuse	85/60	. . the intermediate or auxiliary part having contacts at opposite ends for co-operation with the base
85/303	. . . {Movable indicating elements}	85/62	. . the intermediate or auxiliary part being adapted for screwing into the base
85/306	. . . . {acting on an auxiliary switch or contact}	<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>
85/32	. . . Indicating lamp structurally associated with the protective device	<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 a single one of the preceding main groups</b>
85/34	. . Distinguishing marks, e.g. colour coding	2089/005	. {Multi-purpose combinations, e.g. LS/DI, LS/FI, of normal protective circuit breakers with known other forms of protection, e.g. earthfaults, differential, unbalance}
85/36	. . Means for applying mechanical tension to fusible member	89/02	. Combination of a key operated switch with a manually operated switch, e.g. ignition and lighting switches
85/38	. . Means for extinguishing or suppressing arc ( <a href="#">by powder filling H01H 85/18</a> ; <a href="#">by mechanical tension applied to fusible member H01H 85/36</a> )	89/04	. Combination of a thermally actuated switch with a manually operated switch
2085/381	. . . {with insulating body insertable between the end contacts of the fusible element}	89/06	. Combination of a manual reset circuit breaker with a contactor, i.e. the same circuit controlled by both a protective and a remote control device
2085/383	. . . {with insulating stationary parts}		
2085/385	. . . {Impedances connected with the end contacts of the fusible element}		

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

**2201/00 Contacts**

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

**Emergency protective devices****2203/00 Form of contacts**

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

- 2203/056 . Cuts or depressions in support, e.g. to isolate contacts
- 2203/058 . Contact area function of position on layered keyboard

**2205/00 Movable contacts**

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

**2207/00 Connections**

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

**2209/00 Layers**

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

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

**2211/00 Spacers**

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

**2213/00 Venting**

- 2213/002 . with external pressure
- 2213/004 . . Scavenger; Filter
- 2213/006 . . Labyrinth
- 2213/008 . . Flaps cut out forming valves

- 2213/01 . with internal pressure of other switch sites
- 2213/012 . . Open-cell foam
- 2213/014 . . Accumulator chamber
- 2213/016 . in adhesive layer

**2215/00 Tactile feedback**

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

**2217/00 Facilitation of operation; Human engineering**

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



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

### 2219/00 Legends

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

### 2221/00 Actuators

2221/002 . integral with membrane  
 2221/004 . . U-shaped openings surrounding keys  
 2221/006 . . Adhesive  
 2221/008 . other then push button  
 2221/01 . . also rotatable  
 2221/012 . . Joy stick type  
 2221/014 . . Slide selector  
 2221/016 . . Lever; Rocker  
 2221/018 . . Tumbler  
 2221/02 . . pneumatic  
 2221/022 . . electromagnetic

2221/024 . Transmission element  
 2221/026 . . Guiding or lubricating nylon  
 2221/028 . . . Telescopic guiding  
 2221/03 . . Stoppers for on or off position  
 2221/032 . adjustable  
 2221/034 . . Coded keys  
 2221/036 . Return force  
 2221/038 . . Fluid  
 2221/04 . . magnetic  
 2221/042 . . Foam  
 2221/044 . . Elastic part on actuator or casing  
 2221/046 . bistable  
 2221/048 . . magnetic  
 2221/05 . Force concentrator; Actuating dimple  
 2221/052 . interlocked  
 2221/054 . connected by flexible webs  
 2221/056 . Modular conception  
 2221/058 . to avoid tilting or skewing of contact area or actuator  
 2221/06 . to avoid sticking in on position  
 2221/062 . Damping vibrations  
 2221/064 . Limitation of actuating pressure  
 2221/066 . replaceable  
 2221/068 . having a not operable condition  
 2221/07 . transparent  
 2221/0702 . . Transparent key containing three dimensional (3D) element  
 2221/072 . Stroke amplification  
 2221/074 . One molded piece  
 2221/076 . Protruding in cavity covered by membrane  
 2221/078 . Different operating parts on a bigger one  
 2221/08 . composed of different parts  
 2221/082 . . Superimposed actuators  
 2221/084 . made at least partly of elastic foam  
 2221/088 . actuable from different directions  
 2221/09 . Flexible integral part of housing

### 2223/00 Casings

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

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

#### **2225/00 Switch site location**

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

#### **2227/00 Dimensions; Characteristics**

- 2227/002 . Layer thickness
- 2227/004 . . Membrane
- 2227/006 . . Spacer
- 2227/008 . . Substrate
- 2227/01 . . Adhesive
- 2227/012 . . Conductive rubber
- 2227/014 . . . Conductive particles
- 2227/016 . Switch site protrusions; Force concentrators
- 2227/018 . Printed contacts; Metal foil
- 2227/02 . Vent opening
- 2227/022 . 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; Programme control
- 2231/018 . Musical instrument
- 2231/022 . Telephone handset
- 2231/024 . Dispensing machine
- 2231/026 . Car
- 2231/028 . Watch
- 2231/03 . Elevator
- 2231/032 . Remote control
- 2231/034 . Coordinate determination
- 2231/036 . Radio; TV
- 2231/038 . Level sensing or limit switch
- 2231/04 . Robot
- 2231/042 . Briefcase; Note-book
- 2231/044 . Under water
- 2231/046 . Camera
- 2231/048 . Tools; Drilling machines
- 2231/05 . Card, e.g. credit card
- 2231/052 . Selectors, e.g. dimmers

#### **2233/00 Key modules**

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

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

**2235/00 Springs**

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

- 2235/03 . Two serial springs

**2237/00 Mechanism between key and laykey**

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

**2239/00 Miscellaneous**

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

**2300/00 Orthogonal indexing scheme relating to electric switches, relays, selectors or emergency protective devices covered by [H01H](#)**

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

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