

ECLA**EUROPEAN CLASSIFICATION****H01H****ELECTRIC SWITCHES; RELAYS; SELECTORS; EMERGENCY PROTECTIVE DEVICES**

(contact cables [H01B7/10](#); overvoltage protection resistors, resistive arresters [H01C7/12](#), [H01C8/04](#); electrolytic self-interrupters [H01G9/18](#); switching devices of the waveguide type H01P; devices for interrupted current collection [H01R39/00](#); overvoltage arresters using spark gaps [H01T4/00](#); emergency protective circuit arrangements H02H; switching by electronic means without contact-making [H03K17/00](#))

[N: Notes

[C2012.08]

Attention is drawn to the Notes following the titles of class B81 an subclass B81B relating to "micro-structural devices" and micro-structural systems"

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[N: WARNING

[C2011.07] The following IPC groups are not used in the internal ECLA classification scheme. Subject matter covered by these groups is classified in the following ECLA groups :

[H01H33/575](#) covered by [H01H33/56](#)

[H01H33/825](#) " [H01H33/82](#)

[H01H33/835](#) " [H01H33/83](#)

[H01H33/867](#) " [H01H33/86](#)

[H01H33/873](#) " [H01H33/86](#)

[H01H33/915](#) " [H01H33/91](#)

[H01H33/985](#) " [H01H33/98](#)

[H01H33/99](#) " [H01H33/98](#)

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Notes

1. This subclass covers (in groups [H01H69/00](#) to [H01H87/00](#)) devices for the protection of electric lines or electric machines or apparatus in the event of undesired change from normal electric working conditions, the electrical condition serving directly as the input to the device.
2. This subclass does not cover bases, casings, or covers accomodating two or more switching devices or for accomodating a switching device as well as another electric component, e.g. bus-bar, line connector. Those bases, casings or covers are covered by group [H02B1/26](#).
3. In this subclass, the following terms or expressions are used with the meanings indicated :

- "relay" means a switching device having contacts which are operated from electric inputs which supply, directly or indirectly, all the mechanical energy necessary to cause both the closure and the opening of the contacts;
- "driving mechanism" refers to the means by which an operating force applied to the switch is transmitted to the moving contact or contacts;
- "operating" is used in a broader sense than "actuating" which is reserved for those parts not touched by hand to effect switching;
- "acting" or "action" means a self-induced movement of parts

at one stage of the switching.

These connotations apply to all parts of the verbs "to operate", "to actuate" and "to act" and to words derived therefrom, e.g. to "actuation".

4. In this subclass, details are classified as follows :

- details of an unspecified type of switching device, or disclosed as applicable to two or more kinds of switching devices designated by the terms or expressions "switches", "relays", "selector switches", and "emergency protective devices", are classified in groups [H01H1/00](#) to [H01H9/00](#);
- details of an unspecified type of switch, or disclosed as applicable to two or more types of switches as defined by groups [H01H13/00](#) to [H01H43/00](#) and sub-groups [H01H35/02](#), [H01H35/06](#), [H01H35/14](#), [H01H35/18](#), [H01H35/24](#) and [H01H35/42](#), all hereinafter called basic types, are classified in groups [H01H1/00](#) to [H01H9/00](#);
- details of an unspecified type of relay, or disclosed as applicable to two or more types of relays as defined by groups [H01H51/00](#) to [H01H61/00](#), hereinafter called basic types are classified in [H01H45/00](#);
- details of an unspecified protective device, or applicable to two or more types of protective devices as defined by groups [H01H73/00](#) to [H01H83/00](#), hereinafter called basic types, are classified in [H01H71/00](#).

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. [H01H19/02](#), [H01H75/04](#);

- 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 [H03K17/94](#).

Guide heading: **Electric switches**

H01H1/00 **Contacts** (liquid contacts [H01H29/04](#))

- H01H1/00C . [N: Means for testing or for inspecting contacts, e.g. wear indicator (measuring circuits [G01R31/327B2B](#))] [C1202]
- H01H1/00M . [N: Switches making use of microelectromechanical systems (MEMS); (for electrostatic relays [H01H59/00B](#), for electromagnetic relays [H01H50/00C](#); MEMS manufacturing processes B81C)] [C0911]
- H01H1/00N . [N: Switches making use of nanoelectromechanical systems (NEMS)] [C0911]
- H01H1/02 . characterised by the material thereof [N: (containing gas-evolving material [H01H33/76B](#))]

- H01H1/02C . . [N: Materials for reed contacts]
 - H01H1/02D . . [N: specially adapted for vacuum switches]
 - H01H1/02D2 . . . [N: containing as major components Cu and Cr] [N9807]
 - H01H1/021 . . Composite materials [N0503]
- [N: **Notes**
[N0503]
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 1/023 to 1/029 should be classified in all relevant groups.
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- H01H1/023 . . . having a noble metal as the basic material [N0503]
 - H01H1/023B [N: provided with a solder layer] [N0503]
 - H01H1/0233 and containing carbides [N0503]
 - H01H1/0237 and containing oxides [N0503]
 - H01H1/0237B [N: 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 [H01H1/0237](#))] [N0503]
 - H01H1/0237B2 [N: containing as major component CdO] [N0503]
 - H01H1/0237B4 [N: containing as major component SnO₂] [N0503]
 - H01H1/025 . . . having copper as the basic material [N0503]
 - H01H1/027 . . . containing carbon particles or fibers [N0503]
 - H01H1/029 . . . comprising conducting material dispersed in an elastic support or binding material [N0503]
 - H01H1/04 . . Co-operating contacts of different material
 - H01H1/06 . characterised by the shape or structure of the contact-making surface, e.g. grooved
 - H01H1/06B . . [N: formed by freely suspended particles, e.g. magnetic dust or balls]
 - H01H1/08 . . wetted with mercury
 - H01H1/10 . . Laminated contacts with divided contact surface
 - H01H1/12 . characterised by the manner in which co-operating contacts engage
 - H01H1/14 . . by abutting
 - H01H1/16 . . . by rolling; by wrapping; Roller or ball contacts
 - H01H1/18 . . . with subsequent sliding
 - H01H1/20 . . . Bridging contacts [N: (for circuit breakers [H01H73/04B](#))] [C9410]
 - H01H1/20A [N: Facilitate mounting or replacing contact bridge and pressure spring on carrier ([H01H11/00B1](#) takes precedence)] [N0903]
 - H01H1/20B [N: in which the two contact pairs commutate at substantially different moments]
 - H01H1/20C [N: comprising two-parallel bridges] [N9611]
 - H01H1/20D [N: Rotating bridge] [N0903]
 - H01H1/20D2 [N: Details concerning the elastic mounting of the rotating bridge in the

		rotor] [N0903]
H01H1/20D4	. . . . .	[N: Rotating bridge being assembled in a cassette, which can be placed as a complete unit into a circuit breaker (non-rotating bridges H01H71/02B4)] [N0903]
H01H1/20E	. . . . .	[N: Fork-shaped bridge; Two transversally connected contact arms bridging two fixed contacts] [N0903]
H01H1/20F	. . . . .	[N: T-shaped bridge; bridging contact has lateral arm for mounting resiliently or on a pivot] [N0902]
H01H1/20G	. . . . .	[N: Bridging contact surfaces directed at an oblique angle with respect to the movement of the bridge] [N0903]
H01H1/22	. . . . .	with rigid pivoted member carrying the moving contact
H01H1/22B	. . . . .	[N: and a contact pressure spring acting between the pivoted member and a supporting member] [N9612]
H01H1/22B2	. . . . .	[N: the supporting member being pivotable] [N9612]
H01H1/22B4	. . . . .	[N: having a plurality of parallel contact bars] [N0201]
H01H1/24	. . . . .	with resilient mounting
H01H1/24B	. . . . .	[N: the contact forming a part of a coil spring]
H01H1/24C	. . . . .	[N: Spring wire contacts] [N9410]
H01H1/26	. . . . .	with spring blade support
H01H1/28	. . . . .	Assembly of three or more contact-supporting spring blades
H01H1/30	. . . . .	within supporting guides
H01H1/32	. . . . .	Self-aligning contacts
H01H1/34	. . . . .	with provision for adjusting position of contact relative to its co-operating contact
H01H1/36	. . . . .	by sliding (by rolling or wrapping H01H1/16)
H01H1/36B	. . . . .	[N: Bridging contacts]
H01H1/38	. . . . .	Plug-and-socket contacts
H01H1/38B	. . . . .	[N: Contact arrangements for high voltage gas blast circuit breakers]
H01H1/40	. . . . .	Contact mounted so that its contact-making surface is flush with adjoining insulation
H01H1/40B	. . . . .	[N: Contacts forming part of a printed circuit (multilayer keyboard switches H01H13/70B ; thumbwheel switches H01H19/00B ; for rotary switches with axial contact pressure H01H19/58B ; printed contacts per se H05K)]
H01H1/42	. . . . .	Knife-and-clip contacts
H01H1/44	. . . . .	with resilient mounting
H01H1/46	. . . . .	Self-aligning contacts
H01H1/48	. . . . .	with provision for adjusting position of contact relative to its co-operating contact
H01H1/50	. . . . .	Means for increasing contact pressure, preventing vibration of contacts, holding contacts together after engagement, or biasing contacts to the open position
H01H1/50B	. . . . .	[N: the action of the contact pressure spring becoming active only after engagement of the contacts]
H01H1/50C	. . . . .	[N: by thermal means]
H01H1/52	. . . . .	Contacts adapted to act as latches
H01H1/54	. . . . .	by magnetic force [N: (combined with electrodynamic opening H01H77/10B)]
H01H1/56	. . . . .	Contact arrangements for providing make-before-break operation, e.g. for on-load tap changing [N: (for tap changers H01H9/00B2)]

- H01H1/58 . Electric connections to or between contacts; Terminals ([N: for high tension switches [H01H33/02D](#); for electromagnetic relays [H01H50/14](#); for circuit breakers [H01H71/08](#)]; electric connections in general [H01R](#)) [C9709]
- H01H1/58B . . [N: Connections to printed circuits (for slide switches [H01H15/00D](#); for tumbler switches [H01H23/00D](#))]
- H01H1/58C . . [N: Flexible connections between movable contact and terminal] [C9709]
- H01H1/58D . . [N: comprising an articulating, sliding or rolling contact between movable contact and terminal]
- H01H1/58E . . [N: making use of wire-gripping clips or springs]
- H01H1/58E2 . . . [N: and piercing the wire insulation]
- H01H1/58F . . [N: characterised by the use of a wire clamping screw or nut] [N9709]
- H01H1/58G . . [N: characterised by the use of a plug and socket connector] [N9902]

- H01H1/60 . Auxiliary means structurally associated with the switch for cleaning or lubricating contact-making surfaces (cleaning by normal sliding of contacts [H01H1/18](#), [H01H1/36](#))
- H01H1/60B . . [N: Cleaning of contact-making surfaces by relatively high voltage pulses]

- H01H1/62 . Heating or cooling of contacts

- H01H1/64 . Protective enclosures, baffle plates, or screens for contacts (for arc-extinguishing [H01H9/30](#); for mercury contacts [H01H29/04](#))
- H01H1/64B . . [N: containing getter material (for explosion inhibiting in explosion-proofcases [H01H9/04C3](#); for vacuum switches [H01H33/66E1](#))]
- H01H1/66 . . Contacts sealed in an evacuated or gas-filled envelope, e.g. magnetic dry-reed contacts

- H01H3/00** **Mechanisms for operating contacts** (snap-action arrangements [H01H5/00](#); devices for introducing a predetermined time delay [H01H7/00](#); [N: for tap changers [H01H9/00B3](#)]; thermal actuating or release means [H01H37/02](#))

- H01H3/00B . [N: Means for preventing or breaking contact-welding]
- H01H3/00C . [N: for operating contacts periodically]
- H01H3/00D . [N: making use of superconductivity, e.g. levitation switch]

- H01H3/02 . Operating parts, i.e. for operating driving mechanism by a mechanical force external to the switch
- H01H3/02B . . [N: Combined operation of electric switch and of fluid control device]
- H01H3/02C . . [N: Combined operation of electric switch and variable impedance, e.g. resistor, capacitor ([H01H9/06B](#) takes precedence)] [C0110]
- H01H3/02D . . [N: Emergency operating parts, e.g. for stop-switch in dangerous conditions]
- H01H3/02D2 . . . [N: operated by a pull cord] [N9704]
- H01H3/02E . . [N: two co-operating contacts actuated independently (for combined circuit-breaker-contactors [H01H89/10](#))] [C0909]
- H01H3/04 . . Levers (tumblers [H01H23/14](#))
- H01H3/06 . . . Means for securing to shaft of driving mechanism
- H01H3/08 . . Turn knobs

- H01H3/10 . . . Means for securing to shaft of driving mechanism
- H01H3/12 . . Push-buttons
- H01H3/12B . . . [N: with enlarged actuating area, e.g. of the elongated bar-type; Stabilising means therefor]
- H01H3/12B2 [N: using a scissor mechanism as stabiliser] [N0009]
- H01H3/14 . . adapted for operation by a part of the human body other than the hand, e.g. by foot
- H01H3/14B . . . [N: Cushion or mat switches]
- H01H3/14B2 [N: of the elongated strip type] [N9809]
- H01H3/16 . . 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
- H01H3/16B . . . [N: for actuation by moving a closing member, e.g. door, cover, lid ([H01H27/00B](#) takes precedence; the switch controlling enclosed equipment [H01H9/22C](#); safety arrangements on doors of dishwashers [A47L15/42F](#), of laundry washing machines [D06F37/42](#), of ovens [F24C14/00](#), [F24C15/02B](#); locks with means for operating switches [E05B17/22](#); alarm locks [E05B45/06](#); safety edges for power-operated wings [E05F15/00B](#); safety devices in connection with the locking of doors, covers, guards, or like members giving access to movable machine parts [F16P3/08](#); of microwave ovens [H05B6/76](#))] [C9601]
- H01H3/16B1 [N: associated with a hinge of the closing member]
- H01H3/16B2 [N: associated with locking or manipulating means of the closing member]
- H01H3/16C . . . [N: Self-adjusting mountings, transmissions and the like]
- H01H3/16D . . . [N: operated by movement in any direction]
- H01H3/18 . . . the movement in one direction being intentionally by hand, e.g. for setting automatically cancelled trafficators
- H01H3/20 . . 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
- H01H3/22 . Power arrangements internal to the switch for operating the driving mechanism
- H01H3/22B . . [N: using electrodynamic repulsion]
- H01H3/22C . . [N: Interlocked hand- and power-operating mechanisms]
- H01H3/24 . . using pneumatic or hydraulic actuator [N: (for storing energy in a spring motor [H01H3/30B1](#))]
- H01H3/26 . . using dynamo-electric motor (for storing energy in a spring motor [H01H3/30](#))
- H01H3/26B . . . [N: using a centrifugal mechanism]
- H01H3/26C . . . [N: using a travelling nut mechanism]
- H01H3/28 . . using electromagnet (for storing energy in a spring motor [H01H3/30](#); for operating relays [H01H45/00](#))
- H01H3/30 . . using spring motor
- H01H3/30B . . . [N: Charging means]
- H01H3/30B1 [N: using a fluid actuator]
- H01H3/30B2 [N: using cam devices]
- H01H3/30B4 [N: using unidirectional coupling]
- H01H3/30B8 [N: in which the closing spring charges the opening spring or vice versa]
- H01H3/30C . . . [N: Means for locking the spring in a charged state]

- H01H3/30D . . . [N: using a torsion spring]
- H01H3/30E . . . [N: adapted for operation of a three-position switch, e.g. on-off-earth]
- H01H3/30F . . . [N: Linear spring motors]

- H01H3/32 . Driving mechanisms, i.e. for transmitting driving force to the contacts ([snap-action arrangements H01H5/00](#); [introducing a predetermined time delay H01H7/00](#))
 - H01H3/34 . . using ratchet
 - H01H3/36 . . using belt, chain, or cord
 - H01H3/38 . . using spring or other flexible shaft coupling
 - H01H3/40 . . using friction, toothed, or screw-and-nut gearing
 - H01H3/42 . . using cam or eccentric
 - H01H3/44 . . using Geneva movement
 - H01H3/46 . . using rod or lever linkage, e.g. toggle
 - H01H3/48 . . using lost-motion device
 - H01H3/50 . . with indexing or locating means, e.g. indexing by ball and spring
 - H01H3/50B . . . [N: making use of electromagnets] [N9510]
 - H01H3/52 . . with means to ensure stopping at intermediate operative positions

- H01H3/54 . Mechanisms for coupling or uncoupling operating part, driving mechanism or contacts
 - H01H3/56 . . using electromagnetic clutch
 - H01H3/58 . . using friction, toothed, or other mechanical clutch

- H01H3/60 . Mechanical arrangements for preventing or damping vibration or shock
 - H01H3/60B . . [N: making use of a fluid damper] [N9605]

- H01H3/62 . Lubricating means structurally associated with the switch ([for lubricating contact-making surfaces H01H1/60](#))

- H01H5/00** **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**

- H01H5/02 . Energy stored by the attraction or repulsion of magnetic parts

- H01H5/04 . Energy stored by deformation of elastic members ([by deformation of bimetallic elements in thermally-actuated switches H01H37/54](#))

- H01H5/04B . . [N: making use of cooperating spring loaded wedging or camming parts between operating member and contact structure] [N9510]

- H01H5/06 . . by compression or extension of coil springs
 - H01H5/08 . . . one end of spring transmitting movement to the contact member when the other end is moved by the operating part
 - H01H5/10 . . . 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

- H01H5/12 . . . having two or more snap-action motions in succession

- H01H5/14 . . by twisting of torsion members
 - H01H5/16 . . . with auxiliary means for temporarily holding parts until torsion member is

- sufficiently strained
- H01H5/18 . . by flexing of blade springs
- H01H5/20 . . . single blade moved across dead-centre position
- H01H5/22 . . . blade spring with at least one snap-acting leg and at least one separate contact-carrying or contact-actuating leg
- H01H5/24 having three legs
- H01H5/26 . . . having two or more snap-action motions in succession
- H01H5/28 . . . two separate blade springs forming a toggle
- H01H5/30 . . by buckling of disc springs

H01H7/00 **Devices for introducing a predetermined time delay between the initiation of the switching operation and the opening or closing of the contacts** ([time or time-programme switches H01H43/00](#))

- H01H7/02 . with fluid timing means
- H01H7/03 . . with dash-pots
- H01H7/04 . . with flies, i.e. fan governors
- H01H7/06 . with thermal timing means ([thermally actuated switches H01H37/00](#))
- H01H7/08 . with timing by mechanical speed-control devices
- H01H7/10 . . by escapement
- H01H7/12 . . . mechanical
- H01H7/14 . . . electromagnetic
- H01H7/16 . Devices for ensuring operation of the switch at a predetermined point in the ac cycle ([circuit arrangements H01H9/56](#))

H01H9/00 **Details of switching devices, not covered by groups [H01H1/00](#) to [H01H7/00](#)** (casings for switchgear [H02B1/26](#); casings for electrical apparatus in general [H05K5/00](#))

- H01H9/00B . [N: Tap change devices]
- H01H9/00B1 . . [N: Voltage selector switches]
- H01H9/00B2 . . [N: Contact arrangements for tap changers]
- H01H9/00B3 . . [N: Operating mechanisms]
- H01H9/00B3B . . . [N: with means for indicating the selected tap or limiting the number of selectable taps]
- H01H9/00B4 . . [N: making use of vacuum switches]
- H01H9/00B5 . . [N: Casings; Mountings; Disposition in transformer housing]
- H01H9/00C . [N: Auxiliary contact devices ([for arc transfer H01H9/38](#); [for electromagnetic relays H01H50/54B](#))]
- H01H9/00D . [N: particular to three-phase switches ([synchronous switching H01H9/56B](#))] [C9410]
- H01H9/02 . Bases, casings, or covers ([accommodating more than one switch or a switch and another electrical component H02B1/26](#))

- H01H9/02B . . [N: Adjustable mounting of casings]
- H01H9/02C . . [N: Hand-held casings]
- H01H9/02C2 . . . [N: Line cord switches] [N9612]
- H01H9/02C4 . . . [N: specially adapted for remote control, e.g. of audio or video apparatus] [N9611]
- H01H9/02C4B [N: Protective enclosures; Cushioning means] [N9611]
- H01H9/02C4C [N: Stands or organisers to facilitate location or operation] [N9611]
- H01H9/02D . . [N: Protective covers for terminals]
- H01H9/02E . . [N: structurally combining a switch and an electronic component (for relays [H01H50/02B](#))]
- H01H9/04 . . Dustproof, splashproof, drip-proof, waterproof, or flameproof casings
- H01H9/04B . . . [N: Casings hermetically closed by a diaphragm through which passes an actuating member (vacuum switches [H01H33/66](#))]
- H01H9/04C . . . [N: Explosion-proof cases]
- H01H9/04C1 [N: with pressure-relief devices]
- H01H9/04C2 [N: with interlocking mechanism between cover and operating mechanism]
- H01H9/04C3 [N: with internal explosion inhibiting means]
- H01H9/04D . . . [N: provided with venting means]
- H01H9/06 . . 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
- H01H9/06B . . . [N: enclosing a continuously variable impedance]
- H01H9/06C . . . [N: enclosing a reversing switch]
- H01H9/08 . . Arrangements to facilitate replacement of a switch, e.g. cartridge housing
- H01H9/08B . . [N: contact separation effected by removing contact carrying element]
- H01H9/10 . . Adaptation for built-in fuses (mounting switch and fuse separately on, or in, common support [H02B](#))
- H01H9/10B . . [N: Fuses mounted on or constituting the movable contact parts of the switch]
- H01H9/10C . . [N: with interlocking mechanism between switch and fuse]
- H01H9/10D . . [N: fuse and switch being connected in parallel]
- H01H9/12 . . Means for earthing parts of switch not normally conductively connected to the contacts
- H01H9/14 . . Adaptation for built-in safety spark gaps
- H01H9/16 . . Indicators for switching condition, e.g. "on" or "off"
- H01H9/16B . . [N: comprising light emitting elements]
- H01H9/16B1 . . . [N: Means to facilitate removal or replacement of light-emitting elements]
- H01H9/16C . . [N: comprising numbered dials (thumb-wheel switches [H01H19/00B](#))]
- H01H9/16D . . [N: Circuits for remote indication (for protection circuits [H02H3/04](#); for distribution networks [H02J13/00](#))]
- H01H9/16E . . [N: making use of an electromagnetic wave communication]
- H01H9/18 . . Distinguishing marks on switches, e.g. for indicating switch location in the dark; Adaptation of switches to receive distinguishing marks

- H01H9/18B . . [N: using a programmable display, e.g. LED or LCD] [N9802]
- H01H9/18C . . [N: Illumination of the symbols or distinguishing marks ([H01H9/18B](#) takes precedence)] [N9902]
- H01H9/18D . . [N: Fluorescent or phosphorescent symbols or distinguishing marks ([H01H9/18B](#) takes precedence)] [N9902]
- H01H9/20 . Interlocking, locking, or latching mechanisms ([contacts adapted to act as latches H01H1/52](#); [by an auxiliary movement of the operating part or of an attachment thereto H01H3/20](#); [N: for withdrawable switchgear [H02B11/00](#)])
- H01H9/22 . . for interlocking between casing, cover, or protective shutter and mechanism for operating contacts [N: ([explosion-proof cases H01H9/04C2](#); [built-in fuses and interlocking mechanisms H01H9/10C](#); [by automatic release of circuit breakers H01H71/12E](#))]
- H01H9/22B . . . [N: Defeatable locking means]
- H01H9/22C . . . [N: the casing containing electrical equipment other than and operated by the switch] [N9502]
- H01H9/24 . . for interlocking two or more parts of the mechanism for operating contacts
- H01H9/26 . . for interlocking two or more switches ([N: [H01H13/56B4](#) takes precedence]; [by a detachable member H01H9/28](#); [N: for electromagnetic relays [H01H50/32C](#)] [C9605])
- H01H9/26B . . . [N: using flexible transmission elements, e.g. Bowden cable] [N9812]
- H01H9/28 . . for locking switch parts by a key or equivalent removable member ([switches operated by a key H01H27/00](#); [locking by removable part of two-part coupling device H01R](#))
- H01H9/28B . . . [N: making use of a padlock ([H01H9/28E](#) takes precedence)] [N9604]
- H01H9/28B2 [N: 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] [N9604]
- H01H9/28B2B [N: the part being removable] [N9604]
- H01H9/28C . . . [N: Locking mechanisms incorporated in the switch assembly and operable by a key or a special tool] [N9604]
- H01H9/28D . . . [N: making use of a removable locking part acting directly on the operating part ([H01H9/28B](#) takes precedence)] [N9604]
- H01H9/28E . . . [N: wherein the operating part is made inaccessible or more difficult to access by a lid, cover or guard, e.g. lockable covers] [N9604]
- H01H9/30 . Means for extinguishing or preventing arc between current-carrying parts
- H01H9/30B . . [N: wherein arc-extinguishing gas is evolved from stationary parts] [N9809]
- H01H9/32 . . Insulating body insertable between contacts
- H01H9/34 . . Stationary parts for restricting or subdividing the arc, e.g. barrier plate
- H01H9/34B . . . [N: Barrier plates carrying electrodes]
- H01H9/34C . . . [N: Venting arrangements for arc chutes]
- H01H9/34D . . . [N: Mounting of arc chutes]
- H01H9/34E . . . [N: Details concerning the arc formation chamber] [N9412]
- H01H9/36 . . . Metal parts
- H01H9/36B [N: Mounting of plates in arc chamber] [N9602]
- H01H9/38 . . Auxiliary contacts on to which the arc is transferred from the main contacts ([using arcing-horns H01H9/46](#))

- H01H9/38B . . . [N: Arcing contact pivots relative to the movable contact assembly] [N0006]
- H01H9/38C . . . [N: Arcing contact pivots relative to the fixed contact assembly] [N0006]
- H01H9/40 . . Multiple main contacts for the purpose of dividing the current through, or potential drop along, the arc [N: (multiple parallel contact bars [H01H1/22B4](#))] [C0201]
- H01H9/42 . . Impedances connected with contacts
- H01H9/44 . . using blow-out magnet
- H01H9/44B . . . [N: using permanent magnets]
- H01H9/44C . . . [N: using magnetisable elements associated with the contacts]
- H01H9/46 . . using arcing-horn (using blow-out magnet [H01H9/44](#); arcing-horns per se [H01T4/14](#))
- H01H9/46B . . . [N: Shunt circuit closed by transferring the arc onto an auxiliary electrode]
- H01H9/48 . Means for preventing discharge to non-current-carrying parts, e.g. using corona ring
- H01H9/50 . Means for detecting the presence of an arc or discharge
- H01H9/52 . Cooling of switch parts (cooling of contacts [H01H1/62](#))
- H01H9/54 . Circuit arrangements not adapted to a particular application of the switching device and for which no provision exists elsewhere
- H01H9/54B . . [N: Contacts shunted by semiconductor devices] [C9410]
- H01H9/54B1 . . . [N: Contacts shunted by static switch means] [C9410]
- H01H9/54C . . [N: Combinations of mechanical switches and static switches, the latter being controlled by the former] [C9410]
- H01H9/54D . . [N: Electromechanical and static switch connected in series]
- H01H9/56 . . for ensuring the operation of the switch at a predetermined point in the cycle
- H01H9/56B . . . [N: for multipolar switches, e.g. different timing for different phases, selecting phase with first zero-crossing] [N9410]

- H01H11/00** **Apparatus or processes specially adapted for manufacture of electric switches**
(processes specially adapted for manufacture of rectilinearly movable switches having a plurality of operating members associated with different sets of contacts, e.g. keyboards, [H01H13/88](#); processes or apparatus specially adapted for the manufacture or treatment of micro-structural devices or systems, e.g. in combination with electrical devices, B81C) [C0503]

- H01H11/00B . [N: for converting electric switches ([H01H13/56B2](#) takes precedence)] [C9605]
- H01H11/00B1 . . [N: for converting normally open to normally closed switches and vice versa]
- H01H11/00B2 . . [N: for allowing different operating parts]
- H01H11/00B3 . . [N: for allowing different types or orientation of connections to contacts]

- H01H11/00C . [N: of reed switches]

- H01H11/00D . [N: comprising a successive blank-stamping, insert-moulding and severing operation]

- H01H11/00E . [N: Testing or measuring non-electrical properties of switches, e.g. contact velocity (monitoring contacts [H01H1/00C](#); monitoring gas density [H01H33/56D](#); monitoring vacuum [H01H33/66E](#); calibrating [H01H69/01](#); adjusting [H01H71/74](#); testing of electrical properties [G01R31/333](#))]

- H01H11/02 . for mercury switches
- H01H11/04 . of switch contacts
- H01H11/04B . . [N: by bonding of a contact marking face to a contact body portion]
- H01H11/04B1 . . . [N: by mechanical deformation]
- H01H11/04B2 . . . [N: by resistance welding]
- H01H11/04B3 . . . [N: with the help of an intermediate layer (contacts provided with a solder layer [H01H1/02A1B](#))]
- H01H11/04C . . [N: by powder-metallurgical processes]
- H01H11/06 . . Fixing of contacts to carrier; [N: Fixing of contacts to insulating carrier]

- H01H13/00** **Switches having rectilinearly-movable operating part or parts adapted for pushing or pulling in one direction only, e.g. push-button switch (wherein the operating part is flexible [H01H17/00](#))**

- H01H13/02 . Details (specially adapted for rectilinearly movable switches having operating members associated with different sets of contacts, e.g. keyboards, [H01H13/70](#)) [C0503]
- H01H13/02B . . [N: Light-emitting indicators (for multi-layer switches [H01H13/83](#))] [C0909]
- H01H13/04 . . Cases; Covers
- H01H13/06 . . . Dustproof, splashproof, drip-proof, waterproof or flameproof casings
- H01H13/06B [N: Casings hermetically closed by a diaphragm through which passes an actuating member (vacuum switches [H01H33/66](#))]
- H01H13/08 . . . Casing of switch constituted by a handle serving a purpose other than the actuation of the switch
- H01H13/10 . . Bases; Stationary contacts mounted thereon
- H01H13/12 . . Movable parts; Contacts mounted thereon
- H01H13/14 . . . Operating parts, e.g. push-button
- H01H13/16 adapted for operation by a part of the human body other than the hand, e.g. by foot
- H01H13/18 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
- H01H13/18B [N: for actuation by moving a closing member, e.g. door, cover ([H01H13/18C](#), [H01H27/00B](#) take precedence; the switch controlling enclosed equipment [H01H9/22C](#))] [C9906]
- H01H13/18C [N: wherein the pushbutton is rectilinearly actuated by a lever pivoting on the housing of the switch] [N9906]
- H01H13/20 . . . Driving mechanisms
- H01H13/22 acting with snap action (depending upon deformation of elastic member [H01H13/26](#))
- H01H13/24 with means for introducing a predetermined time delay
- H01H13/26 . . Snap-action arrangements depending upon deformation of elastic members
- H01H13/28 . . . using compression or extension of coil springs
- H01H13/28B [N: having a symmetrical configuration ([H01H13/30](#) to [H01H13/34](#) take precedence)]

- H01H13/30 one end of spring transmitting movement to the contact member when the other end is moved by the operating part
- H01H13/32 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
- H01H13/34 having two or more snap-action motions in succession
- H01H13/36 using flexing of blade springs
- H01H13/36B [N: having a symmetrical configuration ([H01H13/38](#) to [H01H13/46](#) take precedence)]
- H01H13/38 Single blade moved across dead-centre position
- H01H13/40 Blade spring with at least one snap-acting leg and at least one separate contact-carrying or contact-actuating leg
- H01H13/42 having three legs
- H01H13/44 having two or more snap-action motions in succession
- H01H13/46 two separate blade springs forming a toggle
- H01H13/48 using buckling of disc springs

- H01H13/50 having a single operating member
- H01H13/50B [N: Stacked switches]
- H01H13/50C [N: with a make-break action in a single operation]
- H01H13/52 the contact returning to its original state immediately upon removal of operating force, e.g. bell-push switch
- H01H13/54 the contact returning to its original state a predetermined time interval after removal of operating force, e.g. for staircase lighting
- H01H13/56 the contact returning to its original state upon the next application of operating force
- H01H13/56B [N: making use of a heart shaped cam] [N9605]
- H01H13/56B2 [N: convertible to momentary push button switches] [N9605]
- H01H13/56B4 [N: the contact also returning by some external action, e.g. interlocking, protection, remote control] [N9605]
- H01H13/58 with contact-driving member rotated step-wise in one direction
- H01H13/58B [N: wherein the movable contact rotates around the axis of the push button] [N9907]
- H01H13/60 with contact-driving member moved alternately in opposite directions
- H01H13/62 the contact returning to its original state upon manual release of a latch ([latch released by second push-button H01H13/68](#))
- H01H13/64 wherein the switch has more than two electrically distinguishable positions, e.g. multi-position push-button switches
- H01H13/66 the operating member having only two positions

- H01H13/68 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 H01H15/22](#))

- H01H13/70 having a plurality of operating members associated with different sets of contacts, e.g. keyboard ([N: keyboards specially adapted for specific applications, see the relevant subclasses or groups, e.g. B41J, [G06F3/023](#), [H04L17/00](#), [H04M1/00](#); multiple switches specially adapted for electromechanical clocks or watches [G04C3/00K4](#); mounting together a plurality of independent switches [H02B](#)) [C9801]

- H01H13/70D . . [N: comprising a separate movable contact element for each switch site, all other elements being integrated in layers]
- H01H13/70E . . [N: in which the movable contacts of each switch site or of a row of switch sites are formed in a single plate]
- H01H13/702 . . with contacts carried by or formed from layers in a multilayer structure, e.g. membrane switches [N0503]
- H01H13/703 . . . characterised by spacers between contact carrying layers [N0503]
- H01H13/704 . . . characterised by the layers, e.g. by their material or structure ([H01H13/703 takes precedence](#)) [N0503]
- H01H13/705 . . . characterised by construction, mounting or arrangement of operating parts, e.g. push-buttons or keys [N0503]
- H01H13/7057 characterised by the arrangement of operating parts in relation to each other, e.g. pre-assembled groups of keys [N0503]
- H01H13/7065 characterised by the mechanism between keys and layered keyboards [N0503]
- H01H13/7073 characterised by springs, e.g. Euler springs [N0503]
- H01H13/72 . . wherein the switch has means for limiting the number of operating members that can concurrently be in the actuated position
- H01H13/74 . . . each contact set returning to its original state only upon actuation of another of the operating members
- H01H13/76 . . 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
- H01H13/78 . . characterised by the contacts or the contact sites [N0503]
- H01H13/785 . . . characterised by the material of the contacts, e.g. conductive polymers [N0503]
- H01H13/79 . . . characterised by the form of the contacts, e.g. interspersed fingers or helical networks [N0503]
- H01H13/80 . . . characterised by the manner of cooperation of the contacts, e.g. with both contacts movable or with bounceless contacts [N0503]
- H01H13/803 . . . characterised by the switching function thereof, e.g. normally closed contacts or consecutive operation of contacts [N0503]
- H01H13/807 . . . characterised by the spatial arrangement of the contact sites, e.g. superimposed sites [N0503]
- H01H13/81 . . characterised by electrical connections to external devices [N0503]
- H01H13/82 . . characterised by contact space venting means [N0503]
- H01H13/83 . . characterised by legends, e.g. Braille, liquid crystal displays, light emitting or optical elements [N0503]
- H01H13/84 . . characterised by ergonomic functions, e.g. for miniature keyboards; characterised by operational sensory functions, e.g. sound feedback ([legends H01H13/83](#)) [N0503]
- H01H13/85 . . characterised by tactile feedback features [N0503]
- H01H13/86 . . characterised by the casing, e.g. sealed casings or casings reducible in size [N0503]
- H01H13/88 . . Processes specially adapted for manufacture of rectilinearly movable switches having a plurality of operating members associated with different sets of contacts, e.g. keyboards [N0503]
- H01H15/00** . . **Switches having rectilinearly-movable operating part or parts adapted for actuation in opposite directions, e.g. slide switch**

- H01H15/00D . [N: adapted for connection with printed circuit boards (in general [H01H1/58B](#))]
- H01H15/02 . Details
- H01H15/02B . . [N: Light-emitting indicators]
- H01H15/04 . . Stationary parts; Contacts mounted thereon
- H01H15/06 . . Movable parts; Contacts mounted thereon
- H01H15/08 . . . Contact arrangements for providing make-before-break operation, e.g. for on-load tap-changing
- H01H15/10 . . . Operating parts
- H01H15/10B [N: comprising cam devices]
- H01H15/10B1 [N: Adjustable cams]
- H01H15/10B2 [N: actuating conventional selfcontained microswitches ([H01H15/10B1](#) takes precedence)] [N0003]
- H01H15/12 adapted for operation by a part of the human body other than the hand, e.g. by foot
- H01H15/14 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
- H01H15/16 Driving mechanisms
- H01H15/18 acting with snap action
- H01H15/20 with means for introducing a predetermined time delay
- H01H15/22 . having a single operating part protruding from different sides of switch casing for alternate actuation from opposite ends
- H01H15/24 . having a single operating part only protruding from one side of the switch casing for alternate pushing and pulling
- H01H17/00** **Switches having flexible operating part adapted only for pulling, e.g. cord, chain [N: (for emergency stop switches [H01H3/02D2](#))] [C9704]**
- H01H17/02 . Details
- H01H17/04 . . Stationary parts (guides [H01H17/14](#))
- H01H17/06 . . Movable parts (guides [H01H17/14](#))
- H01H17/08 . . . Operating part, e.g. cord
- H01H17/10 adapted for operation by a part of the human body other than the hand, e.g. by foot
- H01H17/12 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
- H01H17/14 . . Guiding means for flexible operating part
- H01H17/16 . having a single flexible operating part adapted for pulling at one end only
- H01H17/16B . . [N: secured to a part of the switch mechanism that has only rectilinear movement] [N0305]

- H01H17/18 . . . secured to part of the switch driving mechanism that has only angular movement
- H01H17/20 . . . the contact returning to its original state immediately upon removal of operating force
- H01H17/22 . . . the contact returning to its original state upon the next application of operating force
- H01H17/24 . . . secured to a part of the switch driving mechanism that has both angular and rectilinear motion
- H01H17/26 . . . having two flexible operating parts; having a single operating part adapted for pulling at both ends
- H01H17/28 . . . secured to part or parts of the switch driving mechanism having only rectilinear motion
- H01H17/30 . . . secured to a part or parts of the switch driving mechanism having only angular motion

- H01H19/00** **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 [H01R39/00](#)) [[C0503](#)]**
- H01H19/00B . . . [[N: Thumb wheel switches](#)]
- H01H19/00B2 . . . [[N: having a pushbutton actuator](#)] [[N0107](#)]
- H01H19/00C . . . [[N: Electromechanical pulse generators \(integrated in time-pieces \[G04C3/00K5\]\(#\)\)](#)]
- H01H19/02 . . . Details
- H01H19/02B . . . [[N: Light-emitting indicators](#)]
- H01H19/03 . . . Means for limiting the angle of rotation of the operating part [[N0503](#)]
- H01H19/04 . . . Cases; Covers
- H01H19/06 Dustproof, splashproof, drip-proof, waterproof, or flameproof casings
- H01H19/06B [[N: Casings hermetically closed by a diaphragm through which passes an actuating member \(vacuum switches \[H01H33/66\]\(#\)\)](#)]
- H01H19/08 . . . Bases; Stationary contacts mounted thereon
- H01H19/10 . . . Movable parts; Contacts mounted thereon
- H01H19/11 With indexing means [[N0503](#)]
- H01H19/11B [[N: using molded elastic parts only](#)] [[N0503](#)]
- H01H19/12 Contact arrangements for providing make-before-break operation, e.g. for on-load tap-changing
- H01H19/14 Operating parts, e.g. turn knob
- H01H19/16 adapted for operation by a part of the human body other than the hand, e.g. by foot
- H01H19/18 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
- H01H19/18B [[N: adapted for operation by the simultaneous action of two cam plates, rotating at different speeds](#)]
- H01H19/18C [[N: with travelling nuts](#)]
- H01H19/20 Driving mechanisms allowing angular displacement of the operating part to be

- effective in either direction
- H01H19/22 incorporating lost motion
- H01H19/24 acting with snap action
- H01H19/26 with means for introducing a predetermined time delay
- H01H19/28 Driving mechanisms allowing angular displacement of the operating part to be effective or possible in only one direction
- H01H19/30 incorporating lost motion
- H01H19/32 acting with snap action
- H01H19/34 with means for introducing a predetermined time delay
- H01H19/36 . the operating part having only two operative positions, e.g. relatively displaced by 180 degrees
- H01H19/38 . . Change-over switches
- H01H19/40 . . . having only axial contact pressure
- H01H19/42 . . providing more than two electrically different conditions, e.g. for closing either or both of two circuits
- H01H19/44 . . . having only axial contact pressure
- H01H19/46 . the operating part having three operative positions, e.g. off/star/delta
- H01H19/48 . . having only axial contact pressure
- H01H19/50 . the operating part having four operative positions, e.g. off/two-in-series/one-only/two-in-parallel
- H01H19/52 . . having only axial contact pressure
- H01H19/54 . the operating part having at least five or an unspecified number of operative positions
- H01H19/56 . . Angularly-movable actuating part carrying contacts, e.g. drum switch
- H01H19/56B . . . [N: with an initial separation movement perpendicular to the switching movement]
- H01H19/56C . . . [N: in which the contact making surfaces are inclined, i.e. not perpendicular, to the axial or radial direction]
- H01H19/58 . . . having only axial contact pressure, e.g. disc switch, wafer switch
- H01H19/58B [N: provided with printed circuit contacts]
- H01H19/60 . . Angularly-movable actuating part carrying no contacts
- H01H19/60B . . . [N: in which the actuation of the contacts depends on the direction of rotation]
- H01H19/62 . . . Contacts actuated by radial cams
- H01H19/62B [N: Adjustable cams]
- H01H19/62C [N: actuating bridging contacts (H01H19/62B takes precedence)] [N9902]
- H01H19/63 . . . Contacts actuated by axial cams (H01H19/635B takes precedence) [C0503]
- H01H19/635 . . . Contacts actuated by rectilinearly-movable member linked to operating part, e.g. by pin and slot [N0503]
- H01H19/635B [N: using axial cam devices for transforming the angular movement into linear movement along the axis of rotation] [N0503]
- H01H19/64 . Encased switches adapted for ganged operation when assembled in a line with identical switches, e.g. stacked switches

H01H21/00 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 [H01H23/00](#); switches having an operating part movable angularly in more than one plane [H01H25/04](#)) [C0503]

- H01H21/02 . Details
- H01H21/02B . . [N: Light-emitting indicators]
- H01H21/04 . . Cases; Covers
- H01H21/06 . . . interlocked with operating mechanism
- H01H21/08 . . . Dustproof, splashproof, drip-proof, waterproof, or flame-proof casings
- H01H21/08B [N: Casings hermetically closed by a diaphragm through which passes an actuating member (vacuum switches [H01H33/66](#))]
- H01H21/10 . . . Casing of switch constituted by a handle serving a purpose other than the actuation of the switch
- H01H21/12 . . Bases; Stationary contacts mounted thereon
- H01H21/14 . . Means for increasing contact pressure
- H01H21/16 . . Adaptation for built-in fuse
- H01H21/16B . . . [N: Fuses mounted on, or constituting the movable contact parts of, the switch]
- H01H21/18 . . Movable parts; Contacts mounted thereon
- H01H21/20 . . . Contact arrangements for providing make-before-break operation, e.g. for on-load tap-changing
- H01H21/22 . . . Operating parts, e.g. handle
- H01H21/24 biased to return to normal position upon removal of operating force
- H01H21/24B [N: the contact returning to its original state upon the next application of operating force] [N9804]
- H01H21/26 adapted for operation by a part of the human body other than the hand, e.g. by foot
- H01H21/28 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
- H01H21/28B [N: for actuation by moving a closing member, e.g. door, cover (the switch controlling enclosed equipment [H01H9/22C](#))] [C9502]
- H01H21/28C [N: 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] [N0502]
- H01H21/30 not biased to return to a normal position upon removal of operating force
- H01H21/32 adapted for operation by a part of the human body other than the hand, e.g. by foot
- H01H21/34 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
- H01H21/36 . . . Driving mechanisms
- H01H21/38 incorporating lost motion
- H01H21/40 having snap action
- H01H21/42 produced by compression or extension of coil spring

- H01H21/44 produced by flexing blade springs
- H01H21/46 with two or more snap-action motions in succession
- H01H21/48 incorporating a ratchet mechanism
- H01H21/50 with indexing or latching means, e.g. indexing by ball and spring; with means to ensure stopping at intermediate operative positions
- H01H21/52 with means for introducing a predetermined time delay

- H01H21/54 Lever switches with blade-type contact co-operating with one or two spring-clip contacts, e.g. knife switch
- H01H21/56 making contact in one position only
- H01H21/58 Change-over switches without stable intermediate position
- H01H21/60 Change-over switches with stable intermediate position

- H01H21/86 Switches with abutting contact carried by operating part, e.g. telegraph tapping key
- H01H21/88 with intermediate position of rest

- H01H23/00** **Tumbler or rocker switches, i.e. switches characterised by being operated by rocking an operating member in the form of a rocker button [C0503]**

- [N: **Note**
[N0503]
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
]

- H01H23/00B [N: with more than one electrically distinguishable condition in one or both positions] [N9902]

- H01H23/00D [N: adapted for connection with printed circuit boards (connections to printed circuits in general [H01H1/58B](#))]

- H01H23/02 Details
- H01H23/02B [N: Light-emitting indicators]
- H01H23/04 Cases; Covers
- H01H23/06 Dustproof, splashproof, drip-proof, waterproof, or flame-proof casings
- H01H23/06B [N: Casings hermetically closed by a diaphragm through which passes an actuating member (vacuum switches [H01H33/66](#))]
- H01H23/08 Bases; Stationary contacts mounted thereon
- H01H23/10 Adaptation for built-in fuse
- H01H23/10B [N: Fuses mounted on, or constituting the movable part of, the switch]
- H01H23/12 Movable parts; Contacts mounted thereon
- H01H23/14 Tumblers
- H01H23/14B [N: provided with extensions, e.g. for actuation by a child] [N9506]
- H01H23/14C [N: having a generally flat elongated shape] [N9903]
- H01H23/14C1 [N: the actuating surface having two slightly inclined areas extending from the middle outward] [N9903]
- H01H23/14D [N: having a generally tubular or conical elongated shape, e.g. dolly] [N9903]

- H01H23/14E [N: actuated by superimposed sliding element ([H01H23/14B](#) takes precedence)] [N0003]
- H01H23/16 Driving mechanisms
- H01H23/16B [N: incorporating links interconnecting tumbler and contact arm]
- H01H23/16C [N: with rectilinearly movable member carrying the contacts]
- H01H23/16D [N: with positive action]
- H01H23/16E [N: using cams]
- H01H23/18 incorporating lost motion
- H01H23/20 having snap action
- H01H23/20B [N: using a compression spring between tumbler and an articulated contact plate] [N9902]
- H01H23/22 with means for introducing a predetermined time delay
- H01H23/24 with two operating positions
- H01H23/26 one of which positions is unstable
- H01H23/28 with three operating positions
- H01H23/30 with stable centre positions and one or both end positions unstable

H01H25/00 **Switches with compound movement of handle or other operating part**

- H01H25/00B [N: having an operating member rectilinearly slidable in different directions]
- H01H25/00C [N: 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] [N9906]
- H01H25/00D [N: Operating part movable both angularly and rectilinearly, the rectilinear movement being perpendicular to the axis of angular movement] [N0002]
- H01H25/04 Operating part movable angularly in more than one plane, e.g. joystick
- H01H25/04C [N: having a generally flat operating member depressible at different locations to operate different controls]
- H01H25/06 Operating part movable both angularly and rectilinearly, the rectilinear movement being along the axis of angular movement
- H01H25/06B [N: using separate operating parts, e.g. a push button surrounded by a rotating knob] [N0206]

H01H27/00 **Switches operated by a removable member, e.g. key, plug, plate; Switches operated by setting members according to a single predetermined combination out of several possible settings (locking switch parts to prevent operation [H01H9/28](#); combined with plug-and-socket connectors [H01R](#); with current-carrying plug [H01R31/08](#))**

- H01H27/00B [N: wherein one single insertion movement of a key comprises an unlocking stroke and a switch actuating stroke, e.g. security switch for safety guards]
- H01H27/00B2 [N: the switch being lockable by remote control, e.g. by electromagnet] [N9704]
- H01H27/04 Insulating plug or plate inserted between normally closed contacts

- H01H27/06 . Key inserted and then turned to effect operation of the switch [N: IC integrated in key and connected by turning key [E05B49/00J4](#)]
- H01H27/06B . . [N: 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 [F02N11/00](#); safety means for electric spark ignition [F02P11/00](#))]
- H01H27/08 . . wherein the key cannot be removed until the switch is returned to its original position [N: ([H01H27/06B](#), [H01H27/06C](#) take precedence)]
- H01H27/10 . Switch operated by setting members according to a single predetermined combination out of several possible settings

- H01H29/00** **Switches having at least one liquid contact (solid contacts wetted or soaked with mercury [H01H1/08](#))**

- H01H29/00B . [N: Inertia switches]
- H01H29/00C . [N: Operated by deformation of container]
- H01H29/00D . [N: Self interrupters, e.g. with periodic or other repetitive opening and closing of contacts]

- H01H29/02 . Details
- H01H29/04 . . Contacts; Containers for liquid contacts
- H01H29/06 . . . Liquid contacts characterised by the material thereof
- H01H29/08 . . Means for introducing a predetermined time delay
- H01H29/10 . . . by constricting the flow of the contact liquid
- H01H29/12 . . Operating mechanisms adapted for operation by a part of the human body other than the hand, e.g. by foot
- H01H29/14 . . Operating mechanisms adapted for actuation at a limit or other predetermined position in the path of a body, the relative movement of switch and body being primarily for a purpose other than the actuation of the switch, e.g. door switch, limit switch, floor-levelling switch of a lift

- H01H29/16 . operated by dipping soil contact into stationary contact liquid

- H01H29/18 . with level of surface of contact liquid displaced by non-electrical contact-making plunger

- H01H29/20 . operated by tilting contact-liquid container ([centrifugal mercury switches \[H01H29/26\]\(#\)](#))
- H01H29/22 . . wherein contact is made and broken between liquid and solid
- H01H29/24 . . wherein contact is made and broken between liquid and liquid

- H01H29/26 . with level of surface of contact liquid displaced by centrifugal action

- H01H29/28 . with level of surface of contact liquid displaced by fluid pressure

- H01H29/30 . with level of surface of contact liquid displaced by expansion or evaporation thereof

- H01H29/32 . with contact made by a liquid jet, e.g. earthing switch with contact made by jet of water ([operated by direct electrodynamic action \[H01H53/00\]\(#\)](#))

- H01H31/00** **Air-break switches for high tension without arc-extinguishing or arc-preventing means** (in combination with high tension or heavy-current switches with arc-extinguishing or arc-preventing means [H01H33/00](#); switching arrangements for the supply or distribution of electric power [H02B](#)) [C9606]
- [H01H31/00B](#) . [N: Earthing switches ([H01H31/02](#) to [H01H31/26](#) take precedence; contact made by liquid jet [H01H29/32](#); for substations [H02B1/16](#), [H02B5/01](#); for withdrawable switchgear [H02B11/28](#); for gas-insulated switchgear [H02B13/075](#))]
- [H01H31/00C](#) . [N: adapted to be operated by a hot stick; Hot sticks therefor] [N0102]
- [H01H31/02](#) . Details
- [H01H31/02B](#) . . [N: Base and stationary contacts mounted thereon]
- [H01H31/02C](#) . . [N: Movable parts and contacts mounted thereon]
- [H01H31/04](#) . . Interlocking mechanisms (for interlocking with high-tension or heavy-current switches having arc-extinguishing or arc-preventing means [H01H33/52](#))
- [H01H31/06](#) . . . for interlocking between casing, cover, or protective shutter and mechanism for operating contacts
- [H01H31/08](#) . . . for interlocking two or more parts of the mechanism for operating contacts
- [H01H31/10](#) . . . for interlocking two or more switches (for interlocking with high-tension or heavy-current switches having arc-extinguishing or arc-preventing means [H01H33/52](#))
- [H01H31/12](#) . . Adaptation for built-in fuse
- [H01H31/12B](#) . . . [N: Fuses mounted on, or constituting the movable contact parts of, the switch]
- [H01H31/12B1](#) [N: with a pivotally supported fuse, hanging on a fixed contact in the open position of the switch ([H01H31/12B2](#) takes precedence)]
- [H01H31/12B2](#) [N: Drop-out fuses]
- [H01H31/14](#) . with bridging contact that is not electrically connected to either line contact in open position of switch
- [H01H31/16](#) . . with angularly-movable bridging contact or contact-carrying member
- [H01H31/18](#) . . . actuated through the movement of one or more insulators
- [H01H31/20](#) at least one insulator being rotatable about its own geometrical axis
- [H01H31/22](#) . . . wherein the contact or contacts are rectilinearly movable with respect to the carrying member
- [H01H31/24](#) . . with rectilinearly-movable bridging contact
- [H01H31/26](#) . with movable contact that remains electrically connected to one line in open position of switch
- [H01H31/28](#) . . with angularly-movable contact
- [H01H31/28B](#) . . . [N: wherein the contact or contacts are rectilinearly movable with respect to the carrying member]
- [H01H31/30](#) . . . actuated through the movement of one or more insulators
- [H01H31/32](#) . . with rectilinearly-movable contact
- [H01H31/34](#) . with movable contact adapted to engage an overhead transmission line, e.g. for branching
- [H01H31/36](#) . . Contact moved by pantograph

- H01H33/00 High-tension or heavy-current switches with arc-extinguishing or arc-preventing means**
- H01H33/00B . [N: Very heavy-current switches ([H01H33/02](#) to [H01H33/98](#) take precedence)] [C9410]
 - H01H33/00B1 . . [N: making use of superconducting contacts (power cryotrons [H01L39/20](#); current limitation using superconducting elements [H02H9/02C](#))]
 - H01H33/00C . [N: adapted for interrupting fault currents with delayed zero crossings] [N9410]
 - H01H33/00D . [N: Pedestal mounted switch gear combinations] [N0403]
 - H01H33/02 . Details
 - H01H33/02B . . [N: Use of solid insulating compounds resistant to the contacting fluid dielectrics and their decomposition products, e.g. to SF6 (insulators or insulating bodies characterised by the insulating materials, selection of materials for their insulating or dielectric properties per se [H01B3/00](#))]
 - H01H33/02C . . [N: particular to three-phase circuit breakers (synchronous switching [H01H9/56B](#))] [C9410]
 - H01H33/02D . . [N: Terminal arrangements (for vacuum switches [H01H33/66G](#))] [C0307]
 - H01H33/02E . . [N: Integrated apparatus for measuring current or voltage] [N9607]
 - H01H33/04 . . Means for extinguishing or preventing arc between current-carrying parts (for switches in general [H01H9/30](#))
 - H01H33/04B . . . [N: for arcs formed during closing]
 - H01H33/06 . . . Insulating body insertable between contacts
 - H01H33/08 . . . Stationary parts for restricting or subdividing the arc, e.g. barrier plate
 - H01H33/10 . . . Metal parts
 - H01H33/12 . . . Auxiliary contacts on to which the arc is transferred from the main contacts (using arcing horns [H01H33/20](#))
 - H01H33/12B [N: Load break switches]
 - H01H33/12B1 [N: both breaker and sectionaliser being enclosed, e.g. in SF6-filled container]
 - H01H33/12B2 [N: in which the auxiliary contact pivots on the main contact-arm and performs a delayed and accelerated movement]
 - H01H33/12B2B [N: the auxiliary contact being a whip contact]
 - H01H33/12B3 [N: comprising a separate circuit breaker ([H01H33/12B1](#) takes precedence)]
 - H01H33/12B3B [N: being operated by the distal end of a sectionalising contact arm]
 - H01H33/12B3C [N: movable with a sectionalising contact arm and operated by such movement]
 - H01H33/12B3D [N: being operated by a separate mechanism interlocked with the sectionalising mechanism]
 - H01H33/14 . . . Multiple main contacts for the purpose of dividing the current through, or potential drop along, the arc
 - H01H33/14B [N: of different construction or type]
 - H01H33/16 . . . Impedances connected with contacts
 - H01H33/16B [N: Variable impedances]

- H01H33/16B1 [N: Liquid resistors]
- H01H33/16C [N: the impedance being inserted in the circuit by blowing the arc onto an auxiliary electrode]
- H01H33/16D [N: Details concerning the impedances ([H01H33/16B](#) takes precedence)] [N9702]
- H01H33/16E [N: the impedance being inserted only while closing the switch] [N9705]
- H01H33/16F [N: the impedance being inserted only while opening the switch] [N9705]
- H01H33/16G [N: the impedance being inserted both while closing and while opening the switch] [N9705]
- H01H33/18 using blow-out magnet [N: (for vacuum switches [H01H33/66C](#); pressure-generated arcs rotated by a magnetic field [H01H33/98B](#))] [C9510]
- H01H33/18B [N: using permanent magnets ([H01H33/18D](#) takes precedence)] [C9601]
- H01H33/18C [N: using magnetisable elements associated with the contacts ([H01H33/18D](#) takes precedence)] [C9601]
- H01H33/18D [N: comprising a hollow annular arc runner and a central contact between which a radially drawn arc rotates] [N9601]
- H01H33/20 using arcing horns (using blow-out magnet [H01H33/18](#); arcing horns per se [H01T4/14](#))
- H01H33/22 Selection of fluids for arc-extinguishing
- H01H33/24 Means for preventing discharge to non-current-carrying parts, e.g. using corona ring
- H01H33/24B [N: using movable field electrodes] [N9804]
- H01H33/26 Means for detecting the presence of an arc or other discharge
- H01H33/28 Power arrangements internal to the switch for operating the driving mechanism
- H01H33/28B [N: using electro-dynamic repulsion (assisting the movement of pistons by accelerating coil [H01H33/88B](#))]
- H01H33/30 using fluid actuator
- H01H33/30B [N: for fluid insulated switchgear, wherein the insulating fluid is also the working fluid] [N9801]
- H01H33/30C [N: Working fluid supplies] [N9801]
- H01H33/32 pneumatic
- H01H33/34 hydraulic
- H01H33/36 using dynamo-electric motor (for storing energy in a spring motor [H01H33/40](#))
- H01H33/38 using electromagnet (for storing energy in a spring motor [H01H33/40](#))
- H01H33/40 using spring motor
- H01H33/42 Driving mechanisms
- H01H33/42B [N: making use of an electromagnetic wave communication]
- H01H33/44 Devices for ensuring operation of the switch at a predetermined point in the ac cycle (circuit arrangements [H01H33/59](#))
- H01H33/46 Interlocking mechanisms
- H01H33/48 for interlocking between casing or cover and mechanism for operating contacts
- H01H33/50 for interlocking two or more parts of the mechanism for operating contacts
- H01H33/52 for interlocking two or more switches
- H01H33/53 Cases (for switchgear [H02B1/26](#)); Reservoirs, tanks, piping or valves, for arc-extinguishing fluid; Accessories therefor, e.g. safety arrangements, pressure relief devices

- H01H33/55 . . . Oil reservoirs or tanks; Lowering means therefor (associated with withdrawal mechanism for isolation of switch [H02B11/08](#))
- H01H33/55B [N: Protective arrangements responsive to abnormal fluid pressure, liquid level or liquid displacement, e.g. Buchholz relays (circuits [H02H5/08](#); specially adapted for transformers [H01F27/40A](#))] [N0812]
- H01H33/56 . . . Gas reservoirs
- H01H33/56B [N: composed of different independent pressurised compartments put in communication only after their assemblage]
- H01H33/56C [N: Means for avoiding liquefaction or for disposing of liquefaction products]
- H01H33/56D [N: comprising means for monitoring the density of the insulating gas]
- H01H33/56E [N: Gas-tight sealings for moving parts penetrating into the reservoir] [N9612]
- H01H33/57 . . . Recuperation of liquid or gas
- H01H33/58 . . . Silencers for suppressing noise of switch operation
- H01H33/59 . . . 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
- H01H33/59B [N: for ensuring operation of the switch at a predetermined point of the ac cycle (for multipolar switches [H01H9/56B](#))] [C9410]
- H01H33/59C [N: for interrupting dc]
- H01H33/60 . . . Switches wherein the means for extinguishing or preventing the arc do not include separate means for obtaining or increasing flow of arc-extinguishing fluid
- H01H33/62 . . . wherein the break is in air at atmospheric pressure, e.g. in open air
- H01H33/64 . . . wherein the break is in gas (in air at atmospheric pressure [H01H33/62](#); vacuum switches [H01H33/66](#))
- H01H33/66 . . . Vacuum switches
- H01H33/66T [N: Terminal arrangements] [N1107]
- H01H33/662 Housings or protective screens [N1107]
- H01H33/662B [N: Specific housing details, e.g. sealing, soldering or brazing] [N1107]
- H01H33/662C [N: Specific bellows details] [N1107]
- H01H33/662D [N: Specific screen details, e.g. mounting, materials, multiple screens or specific electrical field considerations] [N1107]
- H01H33/664 Contacts; Arc-extinguishing means, e.g. arcing rings [N1107]
- H01H33/664B [N: making use of a separate coil] [N1107]
- H01H33/664C [N: having cup-shaped contacts, the cylindrical wall of which being provided with inclined slits to form a coil] [N1107]
- H01H33/664D [N: having disc-shaped contacts subdivided in petal-like segments, e.g. by helical grooves] [N1107]
- H01H33/664E [N: having coil-like electrical connections between contact rod and the proper contact] [N1107]
- H01H33/664E2 [N: in which the coil like electrical connections encircle at least once the contact rod] [N1107]
- H01H33/664F [N: having non flat disc-like contact surface] [N1107]
- H01H33/664G [N: having fixed middle contact and two movable contacts] [N1107]
- H01H33/666 Operating arrangements [N1107]

- H01H33/666B [N: Combination with other type of switch, e.g. for load break switches ([H01H33/14B](#) , [H01H33/666C](#) take precedence)] [N1107]
- H01H33/666C [N: using bistable electromagnetic actuators, e.g. linear polarised electromagnetic actuators] [N1107]
- H01H33/666D [N: with pivoting movable contact structure] [N1107]
- H01H33/668 Means for obtaining or monitoring the vacuum [N1107]
- H01H33/668B [N: by gettering] [N1107]
- H01H33/68 Liquid-break switches, e.g. oil-break

- H01H33/70 Switches with separate means for directing, obtaining, or increasing flow of arc-extinguishing fluid
- H01H33/70B [N: wherein the flow is a function of the current being interrupted]
- H01H33/70C [N: characterised by flow directing elements associated with contacts (electrical or mechanical properties of the contact system [H01H1/38B](#))]
- H01H33/70C1 [N: characterised by an insulating tubular gas flow enhancing nozzle ([H01H33/70C2](#) takes precedence)]
- H01H33/70C1B [N: having special gas flow directing elements, e.g. grooves, extensions]
- H01H33/70C2 [N: characterised by a conducting tubular gas flow enhancing nozzle]
- H01H33/70C2B [N: having special gas flow directing elements, e.g. grooves, extensions ([H01H33/70C2C](#) takes precedence)]
- H01H33/70C2C [N: having a bridging element around two hollow tubular contacts]
- H01H33/70C3 [N: characterised by use of special mounting means ([H01H33/70C1](#) to [H01H33/70C2](#) take precedence)]
- H01H33/70C4 [N: characterised by special dielectric or insulating properties or by special electric or magnetic field control properties ([H01H33/70C1](#) to [H01H33/70C3](#) take precedence)]
- H01H33/70C5 [N: characterised by the use of special materials ([H01H33/70C1](#) to [H01H33/70C4](#) take precedence)]
- H01H33/70C6 [N: characterised by movable parts influencing the gas flow ([H01H33/70C1](#) to [H01H33/70C5](#) take precedence)]
- H01H33/70C7 [N: characterised by several arcing chambers in series ([H01H33/70C1](#) to [H01H33/70C6](#) take precedence)]
- H01H33/72 having stationary parts for directing the flow of arc-extinguishing fluid, e.g. arc-extinguishing chamber
- H01H33/73 wherein the break is in air at atmospheric pressure, e.g. in open air
- H01H33/74 wherein the break is in gas (in air at atmospheric pressure [H01H33/73](#))
- H01H33/75 Liquid-break switches, e.g. oil-break
- H01H33/76 wherein arc-extinguishing gas is evolved from stationary parts; Selection of material therefor
- H01H33/76B [N: the gas-evolving material being incorporated in the contact material]
- H01H33/77 wherein the break is in air at atmospheric pressure
- H01H33/78 wherein the break is in gas (in air at atmospheric pressure [H01H33/77](#))
- H01H33/80 flow of arc-extinguishing fluid from a pressure source being controlled by a valve
- H01H33/82 the fluid being air or gas
- H01H33/83 wherein the contacts are opened by the flow of air or gas
- H01H33/84 the fluid being liquid, e.g. oil
- H01H33/85 wherein the contacts are opened by the flow of liquid

- H01H33/86 . . . the flow of arc-extinguishing fluid under pressure from the contact space being controlled by a valve
- H01H33/88 . . . the flow of arc-extinguishing fluid being produced or increased by movement of pistons or other pressure-producing parts
- H01H33/88B [N: the movement being assisted by accelerating coils]
- H01H33/88C [N: with variable-area piston]
- H01H33/88D [N: by movement of rotating pistons]
- H01H33/90 this movement being effected by or in conjunction with the contact-operating mechanism
- H01H33/90B [N: making use of the energy of the arc or an auxiliary arc]
- H01H33/90B2 [N: and assisting the operating mechanism]
- H01H33/90C [N: characterised by the transmission between operating mechanism and piston or movable contact] [N9412]
- H01H33/90D [N: the compression volume being formed by a movable cylinder and a semi-mobile piston] [N9702]
- H01H33/91 the arc-extinguishing fluid being air or gas
- H01H33/92 the arc-extinguishing fluid being liquid, e.g. oil
- H01H33/94 this movement being effected solely due to the pressure caused by the arc itself or by an auxiliary arc [N: (H01H33/90B2 takes precedence)]
- H01H33/95 the arc-extinguishing fluid being air or gas
- H01H33/96 the arc-extinguishing fluid being liquid, e.g. oil
- H01H33/98 . . . 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 [N: (H01H33/90B takes precedence)]
- H01H33/98B [N: in which the pressure-generating arc is rotated by a magnetic field]

H01H35/00

Switches operated by change of a physical condition (operated by change of magnetic or electric field [H01H36/00](#); thermally-actuated switches [H01H37/00](#); time switches [H01H43/00](#); relays [H01H45/00](#) to [H01H61/00](#); sensing elements for providing continuous conversion of a variable into mechanical displacement [G01](#))

Note

A switching device is classified according to that physical condition which, when changed, acts as input to the device, e.g. external explosion causing pressure wave to act upon switch is classified in group [H01H35/24](#), an explosion produced within the switch in group [H01H37/00](#) if initiated by heat, in group [H01H39/00](#) if initiated electrically, and in group [H01H35/14](#) if initiated by an external blow.

- H01H35/00B . . . [N: Switches operated by other part of human body than hands (push-button switches [H01H13/16](#); slide switches [H01H15/20](#); cord switches [H01H17/10](#); other switches [H01H19/16](#) and [H01H21/26](#))]
- H01H35/00C . . . [N: Switches operated by mechanical overload condition, e.g. transmitted force or torque becoming too high]
- H01H35/02 . . . Switches operated by change of position, inclination or orientation of the switch itself in relation to gravitational field (tilting mercury container [H01H29/20](#); change of position due to change of liquid level [H01H35/18](#); [N: specially adapted for electromechanical clocks or watches [G04C3/00K2](#)]) [C9801]
- H01H35/02B . . . [N: the switch being of the reed switch type]

- H01H35/02C . . [N: the switch being discriminative in different directions]
- H01H35/02D . . [N: the inertia mass activating the switch mechanically, e.g. through a lever]
- H01H35/06 . Switches operated by change of speed (operated by change of fluid flow [H01H35/24](#))
- H01H35/10 . . Centrifugal switches (level of mercury displaced by centrifugal action [H01H29/26](#))
- H01H35/12 . . operated by reversal of direction of movement
- H01H35/14 . Switches operated by change of acceleration, e.g. by shock or vibration, inertia switch
[N: (wherein the liquid constitutes a contact of the switch [H01H29/00B](#))]
- H01H35/14B . . [N: Details]
- H01H35/14B1 . . . [N: Damping means to avoid unwanted response]
- H01H35/14B2 . . . [N: Resetting means]
- H01H35/14C . . [N: operated by vibration]
- H01H35/14D . . [N: operated by a particular acceleration-time function]
- H01H35/14E . . [N: operated by plastic deformation or rupture of structurally associated elements]
- H01H35/14F . . [N: the switch being of the reed switch type]
- H01H35/14G . . [N: making use of a rolamite sensor]
- H01H35/18 . Switches operated by change of liquid level or of liquid density, e.g. float switch
(wherein the liquid constitutes a contact of the switch [H01H29/00](#); by magnet carried on a float [H01H36/02](#))
- H01H35/18B . . [N: making use of a thermal switch]
- H01H35/18C . . [N: making use of a cable suspended floater containing an inclination sensing switch] [N9606]
- H01H35/24 . 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 [H01H37/36](#))
- H01H35/24B . . [N: operated by one particular pressure-time function]
- H01H35/24C . . [N: actuated by the deformation of a body of elastic material]
- H01H35/24D . . [N: the switch being of the reed switch type]
- H01H35/26 . . Details
- H01H35/26B . . . [N: 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 [H01H37/18](#))]
- H01H35/26B1 [N: by varying the bias on the pressure sensitive element]
- H01H35/26B1B [N: the bias being magnetic]
- H01H35/26B2 [N: by varying the relative position of switch-casing and pressure sensitive element]
- H01H35/26B3 [N: by adjustment of a motion transmitting system]
- H01H35/26B3B [N: comprising a lost-motion connection]
- H01H35/26B4 [N: by adjustment of one of the co-operating contacts]
- H01H35/26C . . . [N: with different switches operated at substantially different pressures]
- H01H35/26C1 [N: making use of a balance plate pivoting about different axes]
- H01H35/26D . . . [N: Means to detect leaks in the pressure sensitive element]
- H01H35/26E . . . [N: Means to isolate oscillating component of pressure]

- H01H35/26F . . . [N: Means to protect pressure sensitive element against over pressure]
- H01H35/26G . . . [N: comprising pneumatic snap-action]
- H01H35/28 . . . Compensation for variation of ambient pressure or temperature
- H01H35/30 . . . Means for transmitting pressure to pressure-responsive operating part, e.g. by capsule and capillary tube
- H01H35/32 . . . actuated by bellows
- H01H35/34 . . . actuated by diaphragm
- H01H35/34B . . . [N: by snap acting diaphragm]
- H01H35/34C . . . [N: in which the movable contact is formed or directly supported by the diaphragm]
- H01H35/36 . . . actuated by curled flexible tube, e.g. Bourdon tube
- H01H35/38 . . . actuated by piston and cylinder
- H01H35/40 . . . actuated by devices allowing continual flow of fluid, e.g. vane
- H01H35/40B . . . [N: the switch being of the reed switch type]
- H01H35/42 . . . Switches operated by change of humidity

H01H36/00

Switches actuated by change of magnetic field or of electric field, e.g. by change of relative position of magnet and switch, by shielding [N: (specially adapted for electromechanical clocks or watches [G04C3/00K3](#))] [C9801]

- H01H36/00B . . . [N: Permanent magnet actuating reed switches ([H01H35/14F](#) takes precedence)]
- H01H36/00B2 . . . [N: characterised by the co-operation between reed switch and permanent magnet; Magnetic circuits]
- H01H36/00B2B . . . [N: Actuation by moving ferromagnetic material, switch and magnet being fixed]
- H01H36/00B2C . . . [N: comprising a biasing, helping or polarising magnet]
- H01H36/00B4 . . . [N: Mountings; Housings; Connections]
- H01H36/00B6 . . . [N: push-button-operated, e.g. for keyboards]
- H01H36/00B8 . . . [N: Limit switches, also fail-safe operation or anti-tamper considerations]
- H01H36/00B10 . . . [N: periodically operated]
- H01H36/00B12 . . . [N: comprising a plurality of reed switches, e.g. selectors or joystick-operated]
- H01H36/00B14 . . . [N: magnet being removable, e.g. part of key pencil]
- H01H36/00C . . . [N: actuated by relative movement between two magnets]
- H01H36/00D . . . [N: Change of magnetic field wherein the magnet and switch are fixed, e.g. by shielding or relative movements of armature (for reed switches [H01H36/00B2B](#))]
- H01H36/02 . . . actuated by movement of a float carrying a magnet

H01H37/00

Thermally-actuated switches (electrothermal relays operated by electrical input [H01H61/00](#); protective switches with electrothermal release or actuation [H01H73/00](#) to [H01H83/00](#))

- H01H37/00B . . . [N: combined with protective means]
- H01H37/00C . . . [N: with thermal image]

- H01H37/00E . [N: with different switches operated at substantially different temperatures]
- H01H37/02 . Details
- H01H37/04 . . Bases; Housings; Mountings [N: [H01H37/54D](#) takes precedence] [C9902]
- H01H37/04B . . . [N: Mountings on controlled apparatus] [N9902]
- H01H37/06 . . . to facilitate replacement, e.g. cartridge housing
- H01H37/08 . . Indicators; Distinguishing marks
- H01H37/10 . . Compensation for variation of ambient temperature or pressure
- H01H37/12 . . Means for adjustment of "ON" or "OFF" operating temperature
- H01H37/14 . . . by anticipatory electric heater
- H01H37/16 . . . by varying the proportion of input heat received by the thermal element, e.g. by displacement of a shield
- H01H37/18 . . . by varying bias on the thermal element due to a separate spring
- H01H37/20 . . . by varying the position of the thermal element in relation to switch base or casing
- H01H37/22 . . . by adjustment of a member transmitting motion from the thermal element to contacts or latch
- H01H37/24 . . . by adjustment of position of the movable contact on its driving member
- H01H37/26 . . . by adjustment of abutment for "OFF" position of the movable contact
- H01H37/28 . . . by adjustment of the position of the fixed contact
- H01H37/30 . . . by varying the position of the contact unit in relation to switch base or casing
- H01H37/32 . . Thermally-sensitive members ([temperature responsive elements in general G01K](#))
- H01H37/32B . . . [N: making use of shape memory materials (in thermal relays [H01H61/01B](#); release mechanism [H01H71/14C](#); treatment of SMF alloys [C22F1/00M](#); in general [G01K5/48B](#), [G12B1/00](#); for control of temperature [G05D23/02C](#))]
- H01H37/34 . . . Means for transmitting heat thereto, e.g. capsule remote from contact member
- H01H37/36 . . . actuated due to expansion or contraction of a fluid with or without vaporisation ([the fluid forming a contact of the switch H01H29/04, H01H29/30](#))
- H01H37/38 with bellows
- H01H37/40 with diaphragm
- H01H37/42 with curled flexible tube, e.g. Bourdon tube
- H01H37/44 with piston and cylinder
- H01H37/46 actuated due to expansion or contraction of a solid ([deflection of a bimetallic element H01H37/52](#))
- H01H37/48 with extensible rigid rods or tubes
- H01H37/50 with extensible wires under tension
- H01H37/52 actuated due to deflection of bimetallic element
- H01H37/52C [N: comprising a plurality of bimetals acting in the same direction] [N9602]
- H01H37/54 wherein the bimetallic element is inherently snap acting
- H01H37/54B [N: Bistable switches; Resetting means] [N9412]
- H01H37/54C [N: using cantilevered bimetallic snap elements] [N9810]
- H01H37/54D [N: encapsulated in sealed miniaturised housing] [N9902]
- H01H37/54D2 [N: mounted on controlled apparatus] [N9902]
- H01H37/56 having spirally wound or helically wound bimetallic element

- H01H37/58 actuated due to thermally controlled change of magnetic permeability
- H01H37/58B [N: the switch being of the reed switch type]
- H01H37/60 Means for producing snap action (inherent in bimetallic element [H01H37/54](#); caused by a magnet [H01H37/66](#))
- H01H37/62 Means other than thermal means for introducing a predetermined time delay
- H01H37/64 Contacts
- H01H37/66 Magnetic reinforcement of contact pressure; Magnet causing snap action
- H01H37/68 sealed in evacuated or gas-filled tube
- H01H37/70 Resetting means [N: ([H01H37/54B](#) takes precedence)] [C9412]

- H01H37/72 Switches in which the opening movement and the closing movement of a contact are effected respectively by heating and cooling or vice versa

- H01H37/74 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 [H01H73/00](#) to [H01H83/00](#))

- H01H37/76 Contact member actuated by melting of fusible material, actuated due to burning of combustible material or due to explosion of explosive material (fuses [H01H85/00](#))
- H01H37/76B [N: with a fusible element forming part of the switched circuit ([H01H37/76D](#) takes precedence)] [N9806] [C9811]
- H01H37/76C [N: in which contacts are held closed by a thermal pellet] [N9811]
- H01H37/76C2 [N: using a sliding contact between a metallic cylindrical housing and a central electrode] [N9811]
- H01H37/76C4 [N: using a bridging contact] [N9811]
- H01H37/76D [N: Normally open] [N9811]

- H01H39/00** **Switching devices actuated by an explosion produced within the device and initiated by an electric current**

- H01H39/00B [N: provided with a cartridge-magazine]
- H01H39/00C [N: Closing switches] [N0002]
- H01H39/00D [N: Opening by severing a conductor] [N0002]

- H01H41/00** **Switches providing a selected number of consecutive operations of the contacts by a single manual actuation of the operating part (for telephone communication [H04M1/26](#))**

- H01H41/04 Switches without means for setting or mechanically storing a multidigit number
- H01H41/06 dial or slide operated
- H01H41/08 keyboard operated

- H01H41/10 Switches with means for setting or mechanically storing a multidigit number
- H01H41/12 dial or slide operated
- H01H41/14 keyboard operated

- H01H43/00** **Time or time-programme switches providing a choice of time intervals for executing one or more switching actions and automatically terminating their**

operations after the programme is completed (clocks with attached or built-in means operating any device at preselected times or after preselected time-intervals [G04C23/00](#); [N: apparatus which can be set and started to measure-off predetermined intervals [G04F3/06](#)]; programme-control systems [G05B19/00](#))

- H01H43/00B . [N: with timing of the actuation of contacts due to a part rotating at variable speed]
- H01H43/02 . Details
- H01H43/02B . . [N: Bases; Housings; Mountings]
- H01H43/02C . . [N: Terminal arrangements (in general [H01H1/58](#))]
- H01H43/02D . . [N: Contact arrangements]
- H01H43/02E . . [N: Means for manually actuating the contacts or interfering with the cooperation between timer mechanism and contacts]
- H01H43/04 . . Means for time setting
- H01H43/06 . . . comprising separately adjustable parts for each programme step, e.g. with tappets
- H01H43/06B [N: using cams or discs supporting a plurality of individually programmable elements (Schaltreiter)]
- H01H43/08 . . . comprising an interchangeable programme part which is common for all programme steps, e.g. with a punched card
- H01H43/10 . with timing of actuation of contacts due to a part rotating at substantially constant speed
- H01H43/10A . . [N: Driving mechanisms]
- H01H43/10A2 . . . [N: using a pawl and ratchet wheel mechanism] [N0404]
- H01H43/10B . . [N: stopping automatically after one preselected time interval]
- H01H43/10B1 . . . [N: by mechanical coupling device]
- H01H43/10B2 . . . [N: by electromechanical coupling device]
- H01H43/10C . . [N: Manual programme selecting means] [N9612]
- H01H43/12 . . stopping automatically after a single cycle of operation
- H01H43/12B . . . [N: using a drum]
- H01H43/12B1 [N: with provision for adjustment of the intervals by a non-rotating member]
- H01H43/12C . . . [N: using a disc]
- H01H43/12D . . . [N: using a cam]
- H01H43/12D1 [N: with provision for adjustment of the intervals by means carried by the cam]
- H01H43/12D2 [N: with provision for adjustment of the intervals by a non-rotating member]
- H01H43/14 . . . wherein repetition of operation necessitates resetting of time intervals
- H01H43/16 . . stopping automatically after a predetermined plurality of cycles of operation
- H01H43/24 . with timing of actuation of contacts due to a non-rotatable moving part
- H01H43/26 . . the actuation being produced by a substance flowing due to gravity, e.g. sand, water
- H01H43/28 . . the actuation being produced by a part, the speed of which is controlled by fluid-pressure means, e.g. by piston and cylinder
- H01H43/28B . . . [N: adjusting the time interval by means of an adjustable orifice, e.g. needle]

valve]

- H01H43/30 . with timing of actuation of contacts due to thermal action
- H01H43/30B . . [N: based on the expansion or contraction of a material (thermometers based on the expansion or contraction of a material [G01K5/00](#))]
- H01H43/30B2 . . . [N: of solid bodies]
- H01H43/30B2B [N: of one single solid body, e.g. hot wire]
- H01H43/30B2C [N: of two bodies expanding or contracting in a different manner, e.g. bimetallic elements]
- H01H43/30B2C2 [N: actuating the contacts by commanding a mechanical device, e.g. thermal motor]
- H01H43/30B4 . . . [N: of liquids]
- H01H43/30B6 . . . [N: of gases]
- H01H43/30C . . [N: based on the change of electrical properties, e.g. thermistors (thermometers based on the use of electric or magnetic elements directly sensitive to heat [G01K7/00](#))]
- H01H43/30D . . [N: based on the change of magnetic properties (thermometers based on the use of electric or magnetic elements directly sensitive to heat [G01K7/00](#))]
- H01H43/32 . with timing of actuation of contacts due to electrolytic processes; with timing of actuation of contacts due to chemical processes
- H01H43/32B . . [N: Electrolytic decomposition of liquids, e.g. actuation of contacts due to action of the products of reaction]
- H01H43/32C . . [N: Electrolytic decomposition of solid bodies, e.g. action by rupture]
- H01H43/32D . . [N: acting by coulometric transfer of material]

Guide heading: Relays

- H01H45/00** **Details of relays** (electric circuit arrangements [H01H47/00](#); of electromagnetic relays [H01H50/00](#); details of electrically-operated selector switches [H01H63/00](#); [N: testing of relays [G01R31/00](#); relays for emergency protective circuit arrangements [H02H](#)])
- H01H45/02 . Bases; Casings; Covers (frames for mounting two or more relays or for mounting a relay and another electric component [H02B1/01](#), [H04Q1/08](#), [H05K](#))
- H01H45/04 . . Mounting complete relay or separate parts of relay on a base or inside a case
- H01H45/06 . . having windows; Transparent cases or covers
- H01H45/08 . Indicators; Distinguishing marks
- H01H45/10 . Electromagnetic or electrostatic shielding (casings [H01H45/02](#); [N: screening in general [H05K9/00](#)])
- H01H45/12 . Ventilating; Cooling; Heating (for operating electrothermal relays [H01H61/013](#))
- H01H45/14 . Terminal arrangements
- H01H47/00** **Circuit arrangements not adapted to a particular application of the relay and designed to obtain desired operating characteristics or to provide energising current** (circuit arrangements for electro-magnets in general [H01F7/18](#))

- H01H47/00B . [N: Functional circuits, e.g. logic, sequencing, interlocking circuits]
- H01H47/00C . [N: Monitoring or fail-safe circuits]
- H01H47/00C2 . . [N: using plural redundant serial connected relay operated contacts in controlled circuit] [N0103]
- H01H47/00C2B . . . [N: Safety control circuits therefor, e.g. chain of relays mutually monitoring each other] [N0103]
- H01H47/00D . [N: with galvanic isolation between controlling and controlled circuit, e.g. transformer relay]
- H01H47/02 . for modifying the operation of the relay
- H01H47/04 . . 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 [N: (with switching regulator [H01H47/32B](#))]
- H01H47/04B . . . [N: making use of an energy accumulator (for bistable relays [H01H47/22C](#))]
- H01H47/06 . . . by changing number of serially-connected turns or windings
- H01H47/08 . . . by changing number of parallel-connected turns or windings
- H01H47/10 . . . by switching-in or -out impedance external to the relay winding
- H01H47/12 . . for biasing the electromagnet
- H01H47/14 . . for differential operation of the relay
- H01H47/16 . . for conjoint, e.g. additive, operation of the relay
- H01H47/18 . . for introducing delay in the operation of the relay ([short-circuited conducting sleeves, bands or discs H01H50/46](#))
- H01H47/20 . . for producing frequency-selective operation of the relay
- H01H47/22 . for supplying energising current for relay coil
- H01H47/22B . . [N: adapted to be supplied by AC]
- H01H47/22C . . [N: for bistable relays]
- H01H47/24 . . having light-sensitive input
- H01H47/26 . . having thermo-sensitive input
- H01H47/28 . . Energising current supplied by discharge tube
- H01H47/30 . . . by gas-filled discharge tube
- H01H47/32 . . Energising current supplied by semiconductor device
- H01H47/32B . . . [N: by switching regulator]
- H01H47/34 . . Energising current supplied by magnetic amplifier [N: (magnetic amplifiers [H03F9/00](#))]
- H01H47/36 . . Relay coil or coils forming part of a bridge circuit

H01H49/00 Apparatus or processes specially adapted to the manufacture of relays or parts thereof

H01H50/00 Details of electromagnetic relays ([N: [H01H51/28](#) takes precedence;] electric circuit arrangements [H01H47/00](#); details of electrically-operated select or switches [H01H63/00](#); [N: testing of relays [G01R31/00](#); electromagnets in general [H01F7/06](#); relays for emergency protective circuit arrangements [H02H](#)]) [C1202]

- H01H50/00B . [N: particular to three-phase electromagnetic relays ([synchronous switching H01H9/56B](#))] [C9410]
- H01H50/00C . [N: using micromechanics] [N9804]
- H01H50/02 . Bases; Casings; Covers (frames for mounting two or more relays or for mounting a relay and another electric component [H02B1/01](#), [H04Q1/08](#), [H05K](#))
- H01H50/02B . . [N: structurally combining a relay and an electronic component, e.g. varistor, RC circuit ([auxiliary switch inserting resistor during closure H01H50/54B2](#))] [C9907]
- H01H50/02C . . [N: Details concerning sealing, e.g. sealing casing with resin ([in general H01H9/04](#))]
- H01H50/02D . . [N: Details concerning isolation between driving and switching circuit]
- H01H50/04 . . Mounting complete relay or separate parts of relay on a base or inside a case
- H01H50/04B . . . [N: Details concerning assembly of relays]
- H01H50/04B1 [N: 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]
- H01H50/04B2 [N: Details particular to miniaturised relays ([H01H50/04B1](#) takes precedence)]
- H01H50/04B3 [N: Details particular to contactors ([H01H50/04B1](#) takes precedence)]
- H01H50/04C . . . [N: Details concerning mounting a relays]
- H01H50/04C1 [N: Plug-in mounting or sockets]
- H01H50/06 . . having windows; Transparent cases or covers
- H01H50/08 . Indicators; Distinguishing marks
- H01H50/10 . Electromagnetic or electrostatic shielding ([casings H01H50/02](#); [N: screening in general [H05K9/00](#)]) [C9410]
- H01H50/12 . Ventilating; Cooling; Heating ([for operating electrothermal relays H01H61/013](#))
- H01H50/14 . Terminal arrangements [N: ([for coils H01H50/44B](#))] [N9410]
- H01H50/16 . Magnetic circuit arrangements ([cores, yokes, or armatures in general H01F3/00](#); [magnets in general H01F7/00](#))
- H01H50/16B . . [N: Details concerning air-gaps, e.g. anti-remanence, damping, anti-corrosion]
- H01H50/18 . . Movable parts of magnetic circuits, e.g. armature
- H01H50/20 . . . movable inside coil and substantially lengthwise with respect to axis thereof; movable coaxially with respect to coil
- H01H50/22 wherein the magnetic circuit is substantially closed
- H01H50/24 . . . Parts rotatable or rockable outside coil
- H01H50/26 Parts movable about a knife edge
- H01H50/28 Parts movable due to bending of a blade spring or reed
- H01H50/30 . . . Mechanical arrangements for preventing or damping vibration or shock, e.g. by balancing of armature
- H01H50/30B [N: damping vibration due to functional movement of armature ([in air-gap H01H50/16B](#))]
- H01H50/32 . . . Latching movable parts mechanically

- H01H50/32B [N: the mechanical latch being controlled directly by the magnetic flux or part of it]
- H01H50/32C [N: for interlocking two or more relays (in general [H01H9/26](#))]
- H01H50/32D [N: with manual intervention, e.g. for testing, resetting or mode selection] [[N0010](#)]
- H01H50/34 . . . Means for adjusting limits of movement; Mechanical means for adjusting returning force
- H01H50/36 . . Stationary parts of magnetic circuit, e.g. yoke
- H01H50/38 . . . Part of main magnetic circuit shaped to suppress arcing between the contacts of the relay
- H01H50/40 . . . Branched or multiple-limb main magnetic circuits
- H01H50/42 . . . Auxiliary magnetic circuits, e.g. for maintaining armature in, or returning armature to, position of rest, for damping or accelerating movement

- H01H50/44 . Magnetic coils or winding (circuit arrangements [H01H47/00](#); in general [H01F5/00](#))
- H01H50/44B . . [N: Connections to coils] [[N9410](#)]
- H01H50/46 . . Short-circuited conducting sleeves, bands, or discs [N: (for electromagnets [H01F7/12B](#))]

- H01H50/54 . Contact arrangements (contacts for switches in general [H01H1/00](#))
- H01H50/54B . . [N: Auxiliary contact devices (in general [H01H9/00C](#))]
- H01H50/54B2 . . . [N: Auxiliary switch inserting resistor during closure of contactor] [[N9907](#)]
- H01H50/54B4 . . . [N: Self-contained, easily replaceable microswitches] [[N0406](#)]
- H01H50/54C . . [N: for contactors having bridging contacts]
- H01H50/54D . . [N: for miniaturised relays]
- H01H50/56 . . Contact spring sets
- H01H50/58 . . . Driving arrangements structurally associated therewith; Mounting of driving arrangements on armature
- H01H50/60 . . moving contact being rigidly combined with movable part of magnetic circuit [N: (for polarised relays [H01H51/22D2B](#), [H01H51/22F2](#))]
- H01H50/62 . . Co-operating movable contacts operated by separate electrical actuating means

- H01H50/64 . Driving arrangements between movable part of magnetic circuit and contact (structurally associated with contact spring sets [H01H50/58](#))
- H01H50/64B . . [N: intermediate part performing a rectilinear movement ([H01H50/64D](#), [H01H50/66](#) to [H01H50/74](#) take precedence)]
- H01H50/64B1 . . . [N: intermediate part being generally a slide plate, e.g. a card]
- H01H50/64C . . [N: intermediate part performing a rotating or pivoting movement ([H01H50/64D](#), [H01H50/66](#) to [H01H50/74](#) take precedence)]
- H01H50/64C1 . . . [N: having more than one rotating or pivoting part]
- H01H50/64D . . [N: intermediate part making a resilient or flexible connection ([H01H50/66](#) to [H01H50/74](#) take precedence)]
- H01H50/64D1 . . . [N: intermediate part being a blade spring]
- H01H50/64E . . [N: intermediate part comprising interlocking means for different contact pairs ([H01H50/66](#) to [H01H50/74](#) take precedence; for two separate relays [H01H50/32C](#); for ratchets [H01H51/08](#))]
- H01H50/64F . . [N: intermediate part being rigidly combined with armature ([H01H50/66](#) to [H01H50/74](#) take precedence)]

- H01H50/66 . . with lost motion
- H01H50/68 . . with snap action
- H01H50/70 . . operating contact momentarily during stroke of armature
- H01H50/72 . . for mercury contact
- H01H50/74 . . Mechanical means for producing a desired natural frequency of operation of the contacts, e.g. for self-interrupter
- H01H50/76 . . . using reed or blade spring
- H01H50/78 . . . using diaphragm; using stretched wire or ribbon vibrating sideways
- H01H50/80 . . . using torsionally-vibrating member, e.g. wire, strip
- H01H50/82 . . . using spring-loaded pivoted inertia member
- H01H50/84 . . . with means for adjustment of frequency or of make-to-break ratio

- H01H50/86 . 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 H01H47/18](#); [short-circuited conducting sleeves, bands, or discs H01H50/46](#))
- H01H50/88 . . Mechanical means, e.g. dash-pot
- H01H50/90 . . . the delay effective in both directions of operation
- H01H50/92 . . Thermal means ([inherent in electrothermal relays H01H61/00](#))

- H01H51/00** **Electromagnetic relays** ([relays using the dynamo-electric effect H01H53/00](#))

- H01H51/00C . [\[N: Inversing contactors \(H01H50/32C takes precedence\)\]](#)

- H01H51/01 . 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 [\[N: \(H01H51/02 to H01H51/26 take precedence\)\]](#)

- H01H51/02 . Non-polarised relays
- H01H51/04 . . with single armature; with single set of ganged armatures
- H01H51/06 . . . 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 [\[N: \(motors with armature moved one way and returned by spring in general H02K33/02\)\]](#)
- H01H51/06B [\[N: 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 \(details H01H50/20\)\]](#)
- H01H51/08 Contacts alternately opened and closed by successive cycles of energisation and de-energisation of the electromagnet, e.g. by use of a ratchet
- H01H51/08B [\[N: using rotating ratchet mechanism\] \[C0209\]](#)
- H01H51/08B2 [\[N: with axial ratchet elements\] \[N0209\]](#)
- H01H51/08B4 [\[N: with radial ratchet elements\] \[N0209\]](#)
- H01H51/08B4B {7 dots} [\[N: moved alternately in opposite directions\] \[N0209\]](#)
- H01H51/10 Contacts retained open or closed by a latch which is controlled by an electromagnet
- H01H51/12 . . . 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 [N: (motors with armature moved one way and returned by spring in general [H02K33/02](#))]

- H01H51/14 without intermediate neutral position of rest
- H01H51/16 with intermediate neutral position of rest
- H01H51/18 . . . Armature is rotatable through an unlimited number of revolutions
- H01H51/20 . . with two or more independent armatures

- H01H51/22 . Polarised relays [N: ([H01H51/28](#) takes precedence)]
- H01H51/22B . . [N: with rectilinearly movable armature]
- H01H51/22C . . [N: 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 ([H01H51/22B](#) takes precedence)]
- H01H51/22D . . [N: comprising pivotable armature, pivoting at extremity or bending point of armature ([H01H51/22C](#) takes precedence)]
- H01H51/22D2 . . . [N: Armature inside coil]
- H01H51/22D2B [N: Contact forms part of armature]
- H01H51/22E . . [N: comprising rotatable armature, rotating around central axis perpendicular to the main plane of the armature ([H01H51/22C](#) takes precedence)]
- H01H51/22F . . [N: comprising rockable armature, rocking movement around central axis parallel to the main plane of the armature ([H01H51/22C](#) takes precedence)]
- H01H51/22F2 . . . [N: Contacts rigidly combined with armature]
- H01H51/22F2B [N: Blade-spring contacts alongside armature]
- H01H51/24 . . without intermediate neutral position of rest
- H01H51/26 . . with intermediate neutral position of rest

- H01H51/27 . Relays with armature having two stable magnetic states and operated by change from one state to the other

- H01H51/28 . 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 ([H01H51/27](#) takes precedence)
- H01H51/28B . . [N: Mounting of the relay; Encapsulating; Details of connections]
- H01H51/28C . . [N: Constructional details not covered by [H01H51/28B](#)]
- H01H51/28D . . [N: Polarised relays (polarised relays in general [H01H51/22](#))]
- H01H51/28D1 . . . [N: for latching of contacts]
- H01H51/28F . . [N: Details of the shape of the contact springs]
- H01H51/28H . . [N: Freely suspended contacts]

- H01H51/29 . Relays having armature, contacts, and operating coil within a sealed casing ([H01H51/27](#) takes precedence)

- H01H51/30 . specially adapted for actuation by alternating current
- H01H51/32 . . Frequency relays; Mechanically-tuned relays [N: (switched devices for electric time devices [G04C](#); electromechanical resonators [H03H9/00](#); telegraph circuits with oscillating relay [H04L25/20C](#)); mechanical means for producing a desired natural frequency of operation of the contacts [H01H50/74](#)] [C1202]

- H01H51/34 . Self-interrupters, i.e. with periodic or other repetitive opening and closing of contacts

- H01H51/36 . . wherein the make-to-break ratio is varied by hand setting or current strength

- H01H53/00 Relays using the dynamo-electric effect, i.e. relays in which contacts are opened or closed due to relative movement of current-carrying conductor and magnetic field caused by force of interaction between them**

- H01H53/01 . Details
- H01H53/015 . . Moving coils; Contact-driving arrangements associated therewith
- H01H53/02 . Electrodynamic relays, i.e. relays in which the interaction is between two current-carrying conductors
- H01H53/04 . . Ferrodynamic relays, i.e. relays in which the magnetic field is concentrated in ferromagnetic parts

- H01H53/06 . Magnetodynamic relays, i.e. relays in which the magnetic field is produced by a permanent magnet

- H01H53/08 . wherein a mercury contact constitutes the current-carrying conductor

- H01H53/10 . Induction relays, i.e. relays in which the interaction is between a magnetic field and current induced thereby in a conductor [N: (parts of protective circuit arrangements [H02H1/00](#))]
- H01H53/12 . . Ferraris relays

- H01H53/14 . Contacts actuated by an electric motor through fluid-pressure transmission, e.g. using a motor-driven pump [N: (switches using dynamo-electric motor [H01H3/26](#))]

- [N: **WARNING**
Not complete, see also [H01H9/00](#)
]

- H01H55/00 Magnetostrictive relays**

- H01H57/00 Electrostrictive relays; Piezo-electric relays**

- H01H59/00 Electrostatic relays; Electro-adhesion relays** ([N: electrostatic measuring instruments [G01R5/28](#)]; clutches in general using the Johnson-Rahbek effect [H02N13/00](#); [N: electrostatic transducers [H04R19/00](#); systems for preventing the formation of electrostatic charges [H05F](#)])

- H01H59/00B . [N: making use of micromechanics] [N9410]

- H01H61/00 Electrothermal relays** (thermal switches not operated by electrical input, thermal switches with anticipating electrical input [H01H37/00](#); thermally-sensitive members [H01H37/32](#))

- H01H61/00B . [N: Structural combination of a time delay electrothermal relay with an electrothermal protective relay, e.g. a start relay]

- H01H61/01 . Details

- H01H61/01B . . [N: making use of shape memory materials (in general [H01H37/32B](#))]
- H01H61/013 . . Heating arrangements for operating relays
- H01H61/017 . . . Heating by glow discharge or arc in confined space
- H01H61/02 . wherein the thermally-sensitive member is heated indirectly, e.g. resistively, inductively
- H01H61/04 . wherein the thermally-sensitive member is only heated directly
- H01H61/06 . Self-interrupters, i.e. with periodic or other repetitive opening and closing of contacts
- H01H61/06B . . [N: making use of a bimetallic element]
- H01H61/06C . . [N: making use of an extensible wire, rod or strips]
- H01H61/08 . . wherein the make-to-break ratio is varied by hand setting or current strength

Guide heading: **Selectors**

H01H63/00 **Details of electrically-operated selector switches** (details of relays [H01H45/00](#))

- H01H63/02 . Contacts; Wipers; Connections thereto
- H01H63/04 . . Contact-making or contact-breaking wipers; Position indicators therefor
- H01H63/06 . . Contact banks
- H01H63/08 . . . cylindrical
- H01H63/10 . . . plane
- H01H63/12 . . Multiplying connections to contact banks, e.g. using ribbon cables
- H01H63/14 . . . without soldering
- H01H63/16 . Driving arrangements for multi-position wipers
- H01H63/18 . . with step-by-step motion of wiper to a selector position
- H01H63/20 . . . using stepping magnet and ratchet
- H01H63/22 . . . using step-by-step electromagnetic drive without ratchet, e.g. self-interrupting driving magnet
- H01H63/24 . . with continuous motion of wiper until a selected position is reached
- H01H63/26 . . . with an individual clutch-drive from a shaft common to more than one selector switch
- H01H63/28 . . . with an individual motor for each selector switch
- H01H63/30 Pneumatic motor for moving wiper to selected position
- H01H63/32 Spring motor for moving wiper to selected position
- H01H63/33 . Constructional details of co-ordinate-type selector switches not having relays at cross-points
- H01H63/34 . Bases; Cases; Covers; Mountings ([racks for mounting selectors with or without other exchange equipment H04Q1/04](#)); Mounting of fuses on selector switch
- H01H63/36 . Circuit arrangements for ensuring correct or desired operation and not adapted to a particular application of the selector switch

- H01H63/38 . . for multi-position wiper switches
- H01H63/40 . . for multi-position switches without wipers
- H01H63/42 . . . for co-ordinate-type selector switches not having relays at cross-points

- H01H65/00** **Apparatus or processes specially adapted to the manufacture of selector switches or parts thereof**

- H01H67/00** **Electrically-operated selector switches** (details thereof [H01H63/00](#); selecting in general [H04Q](#))

- H01H67/02 . Multi-position wiper switches
- H01H67/04 . . having wipers movable only in one direction for purpose of selection
- H01H67/06 . . . Rotary switches, i.e. having angularly movable wipers
- H01H67/08 with wiper selection
- H01H67/10 with coarse and fine positioning of wipers
- H01H67/12 . . . Linear-motion switches
- H01H67/14 . . having wipers movable in two mutually perpendicular directions for purpose of selection

- H01H67/16 . . . one motion being rotary and the other being parallel to the axis of rotation, e.g. Strowger or "up and around" switches
- H01H67/18 . . . one motion being rotary and the other being perpendicular to the axis of rotation, e.g. "round and in" switches
- H01H67/20 . . . both motions being linear

- H01H67/22 . Switches without multi-position wipers
- H01H67/24 . . Co-ordinate-type relay switches having an individual electromagnet at each cross-point
- H01H67/26 . . Co-ordinate-type selector switches not having relays at cross-points but involving mechanical movement, e.g. cross-bar switch, code-bar switch
- H01H67/30 . . Co-ordinate-type selector switches with field of co-ordinate coil acting directly upon magnetic leaf spring or reed-type contact member
- H01H67/32 . . 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

Guide heading: **Emergency protective devices**

- H01H69/00** **Apparatus or processes for the manufacture of emergency protective devices** (manufacture of switches in general [H01H11/00](#); manufacture of relays in general [H01H49/00](#))

- H01H69/01 . for calibrating or setting of devices to function under predetermined conditions (measuring electric values [G01R](#))

- H01H69/02 . Manufacture of fuses
- H01H69/02B . . [\[N: of printed circuit fuses\]](#)

- H01H71/00** **Details of the protective switches or relays covered by groups [H01H73/00](#) to [H01H83/00](#)**

- H01H71/00B . [N: with provision for switching the neutral conductor]
- H01H71/02 . Housings; Casings; Bases; Mountings
- H01H71/02B . . [N: Mounting or assembling the different parts of the circuit breaker]
- H01H71/02B1 . . . [N: Housing or casing lateral walls containing guiding grooves or special mounting facilities ([H01H71/02B2](#) takes precedence)]
- H01H71/02B2 . . . [N: Majority of parts mounted on central frame or wall]
- H01H71/02B3 . . . [N: having provisions for interchangeable or replaceable parts]
- H01H71/02B4 . . . [N: 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 [H01H1/20D4](#)**)] [N0903]
- H01H71/02C . . [N: Constructional details of housings or casings not concerning the mounting or assembly of the different internal parts]
- H01H71/02C1 . . . [N: Strength considerations]
- H01H71/02D . . [N: Mountings or coverplates for complete assembled circuit breakers, e.g. snap mounting in panel]
- H01H71/02D1 . . . [N: Mounting several complete assembled circuit breakers together (**interconnected mechanisms [H01H71/10B](#)**)]
- H01H71/04 . Means for indicating condition of the switching device [N: (**by means of an auxiliary contact [H01H71/46](#)**)]
- H01H71/06 . Distinguishing marks, e.g. colour coding
- H01H71/08 . Terminals; Connections (**in general [H01R](#)**) [C9709]
- H01H71/08B . . [N: Connections between juxtaposed circuit breakers] [N9804]
- H01H71/10 . Operating or release mechanisms
- H01H71/10B . . [N: Interconnected mechanisms (**[H01H71/10C](#) takes precedence; operated by excess current and other electrical conditions [H01H83/20](#)**)] [C0101]
- H01H71/10B1 . . . [N: with only external interconnections]
- H01H71/10B2 . . . [N: comprising a bidirectional connecting member actuated by the opening movement of one pole to trip a neighbour pole]
- H01H71/10C . . [N: Multiple circuits-breaker, e.g. for the purpose of dividing current or potential drop]
- H01H71/10D . . [N: Means for avoiding unauthorised release]
- H01H71/10E . . [N: Release mechanisms which are reset by opening movement of contacts]
- H01H71/10F . . [N: Modifications for selective or back-up protection; Correlation between feeder and branch circuit breaker (**circuits [H02H3/06](#), [H02H7/26](#)**)]
- H01H71/12 . . Automatic release mechanisms with or without manual release
- H01H71/12B . . . [N: Protection of release mechanisms (**with auxiliary contact [H01H71/48](#)**)]
- H01H71/12C . . . [N: actuated by blowing of a fuse]
- H01H71/12D . . . [N: using a solid-state trip unit (**circuits [H02H](#)**)]
- H01H71/12D2 [N: characterised by sensing elements, e.g. current transformers (**for differential protection [H01H83/14C](#)**)][N0312]
- H01H71/12E . . . [N: actuated by dismounting of circuit breaker or removal of part of circuit breaker]

H01H71/12F	. . .	[N: using piezoelectric, electrostrictive or magnetostrictive trip units] [N0008]
H01H71/12M	. . .	[N: Manual release or trip mechanisms, e.g. for test purposes (two similar push buttons for closing or resetting and opening or tripping H01H71/58 ; test switches for earth fault circuit breakers H01H83/04)]
H01H71/14	. . .	Electrothermal mechanisms [N: (combined with a electro-thermal time delay relay H01H61/00B)]
H01H71/14B	. . . .	[N: actuated due to change of magnetic permeability]
H01H71/14C	. . . .	[N: using shape memory materials (H01H71/16 takes precedence; in general H01H37/32B)]
H01H71/16	. . . .	with bimetal element [N: (combined with detection of imbalance of two or more currents H01H83/22B)]
H01H71/16B	. . . . .	[N: with helically or spirally wound bimetal]
H01H71/16C	. . . . .	[N: with compensation for ambient temperature] [C0101]
H01H71/16D	. . . . .	[N: Heating elements]
H01H71/18	. . . .	with expanding rod, strip, or wire
H01H71/20	. . . .	with fusible mass
H01H71/20B	. . . . .	[N: using a ratchet wheel kept against rotation by solder] [N9905]
H01H71/22	. . . .	with compensation for variation of ambient temperature [N: (H01H71/16C takes precedence)]
H01H71/24	. . .	Electromagnetic mechanisms
H01H71/24B	. . . .	[N: combined with an electromagnetic current limiting mechanism]
H01H71/24C	. . . .	[N: combined with an electrodynamic current limiting mechanism]
H01H71/24D	. . . .	[N: with a holding and a releasing magnet, the holding force being limited due to saturation of the holding magnet]
H01H71/24E	. . . .	[N: using a reed switch (reed switches in general H01H51/28 ; for current measuring G01R19/165E2)]
H01H71/24F	. . . .	[N: characterised by the magnetic circuit or active magnetic elements] [N0011]
H01H71/24G	. . . .	[N: with plunger type armatures] [N0011]
H01H71/24H	. . . .	[N: with rotatable armatures] [N0011]
H01H71/24L	. . . .	[N: characterised by the coil design] [N0011]
H01H71/26	. . . .	with windings acting in opposition [N: (H01H71/24D takes precedence)]
H01H71/28	. . . .	with windings acting in conjunction
H01H71/30	. . . .	having additional short-circuited winding
H01H71/32	. . . .	having permanently magnetised part
H01H71/32B	. . . . .	[N: characterised by the magnetic circuit or active magnetic elements] [N9412]
H01H71/32B2	. . . . .	[N: with plunger type armature] [N9412]
H01H71/32B4	. . . . .	[N: with rotatable armature] [N9412]
H01H71/32C	. . . . .	[N: Housings, assembly or disposition of different elements in the housing] [N9412]
H01H71/32C2	. . . . .	[N: Sealed housings] [N9412]
H01H71/32D	. . . . .	[N: Manufacturing or calibrating methods, e.g. air gap treatments] [N9412]
H01H71/34	. . . .	having two or more armatures controlled by a common winding
H01H71/34B	. . . . .	[N: having a delayed movable core and a movable armature]

H01H71/36	. . . .	frequency selective
H01H71/38	. . . .	wherein the magnet coil also acts as arc blow-out device
H01H71/40	. . . .	Combined electrothermal and electromagnetic mechanisms
H01H71/40B	. . . .	[N: in which the thermal mechanism influences the magnetic circuit of the electromagnetic mechanism]
H01H71/40C	. . . .	[N: in which a bimetal forms the inductor for the electromagnetic mechanism]
H01H71/42	. . . .	Induction-motor, induced-current, or electrodynamic release mechanisms
H01H71/43	. . . .	Electrodynamic release mechanisms
H01H71/44	. . . .	having means for introducing a predetermined time delay (by short-circuited winding H01H71/30 ; by additional armature H01H71/34)
H01H71/44B	. . . .	[N: with dash-pot]
H01H71/44C	. . . .	[N: making use of an inertia mass]
H01H71/46	. . . .	having means for operating auxiliary contacts additional to the main contacts
H01H71/46B	. . . .	[N: housed in a separate casing, juxtaposed to and having the same general contour as the main casing (for neutral conductor H01H71/00B)]
H01H71/46C	. . . .	[N: Self-contained, easily replaceable microswitches] [N0406]
H01H71/48	. . . .	with provision for short-circuiting the electrical input to the release mechanism after release of the switch, e.g. for protection of heating wire
H01H71/50	. . . .	Manual reset mechanisms [N: which may be also used for manual release]
H01H71/50B	. . . .	[N: Means for breaking welded contacts; Indicating contact welding or other malfunction of the circuit breaker]
H01H71/50C	. . . .	[N: Means for increasing the opening stroke of the contacts]
H01H71/50D	. . . .	[N: provided with anti-rebound means (for switches in general H01H1/50)]
H01H71/50L	. . . .	[N: Latching devices between operating and release mechanism]
H01H71/52	. . . .	actuated by lever
H01H71/52A	. . . .	[N: Details concerning the lever handle]
H01H71/52B	. . . .	[N: comprising a cradle-mechanism]
H01H71/52B2	. . . . .	[N: the contact arm being pivoted on cradle and mechanism spring acting between handle and contact arm]
H01H71/52B4	. . . . .	[N: the contact arm being pivoted on handle and mechanism spring acting between cradle and contact arm]
H01H71/52B6	. . . . .	[N: comprising a toggle between cradle and contact arm and mechanism spring acting between handle and toggle knee]
H01H71/52C	. . . . .	[N: the lever forming a toggle linkage with a second lever, the free end of which is directly and releasably engageable with a contact structure]
H01H71/52D	. . . . .	[N: 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]
H01H71/52E	. . . . .	[N: comprising a toggle or collapsible link between handle and contact arm, e.g. sear pin mechanism]
H01H71/52F	. . . . .	[N: comprising an electroresponsive element forming part of the transmission chain between handle and contact arm]
H01H71/54	. . . .	actuated by tumbler
H01H71/56	. . . .	actuated by rotatable knob or wheel
H01H71/58	. . . .	actuated by push-button, pull-knob, or slide
H01H71/60	. . . .	actuated by closure of switch casing

- H01H71/62 . . . with means for preventing resetting while abnormal condition persists, e.g. loose handle arrangement
- H01H71/64 incorporating toggle linkage
- H01H71/66 . . Power reset mechanisms
- H01H71/68 actuated by electromagnet
- H01H71/68B [N: in which the excitation of the electromagnet is interrupted by abnormal conditions]
- H01H71/70 actuated by electric motor
- H01H71/72 actuated automatically a limited number of times

- H01H71/74 . Means for adjusting the conditions under which the device will function to provide protection
- H01H71/74B . . [N: Interchangeable elements]
- H01H71/74C . . [N: Adjusting both electrothermal and electromagnetic mechanism]
- H01H71/74D . . [N: Adjusting only the electrothermal mechanism]
- H01H71/74D1 . . . [N: Adjusting the position (or prestrain) of the bimetal ([H01H71/74D2](#) takes precedence)]
- H01H71/74D2 . . . [N: Poly-phase adjustment]
- H01H71/74E . . [N: Adjusting only the electromagnetic mechanism]

- H01H73/00** **Protective overload circuit-breaking switches in which excess current opens the contacts by automatic release of mechanical energy stored by previous operation of a hand reset mechanism**

- H01H73/02 . Details
- H01H73/04 . . Contacts
- H01H73/04B . . . [N: Bridging contacts (specific details for the contacting bridge per se [H01H1/20](#) and subgroups, e.g. rotating bridge [H01H1/20D](#))] [N9410] [C0903]
- H01H73/06 . . Housings; Casings; Bases; Mountings
- H01H73/08 . . . Plug-in housings [N: (for a plurality of juxtaposed housings [H02B1/056](#))]
- H01H73/10 . . . Cartridge housings, e.g. screw-in housing
- H01H73/12 . . Means for indicating condition of the switch [N: (by means of an auxiliary contact [H01H71/46](#))]
- H01H73/14 . . . Indicating lamp structurally associated with the switch
- H01H73/16 . . Distinguishing marks, e.g. colour coding
- H01H73/18 . . Means for extinguishing or suppressing arc [N: (in general [H01H9/30](#) to [H01H9/46](#); magnet coil acting as blow-out device [H01H71/38](#))]
- H01H73/20 . . Terminals; Connections (in general [H01R](#))

- H01H73/22 . having electrothermal release and no other automatic release (cartridge type [H01H73/62](#))
- H01H73/24 . . reset by lever
- H01H73/26 . . reset by tumbler
- H01H73/28 . . reset by rotatable knob or wheel
- H01H73/30 . . reset by push-button, pull-knob or slide
- H01H73/30B . . . [N: with an insulating body insertable between the contacts when released by a

- bimetal element]
- H01H73/30C . . . [N: the push-button supporting pivotally a combined contact-latch lever]
 - H01H73/32 . . reset by closure of switch casing
 - H01H73/34 . . reset action requiring replacement or reconditioning of a fusible or explosive part

 - H01H73/36 . having electromagnetic release and no other automatic release (cartridge type [H01H73/64](#))
 - H01H73/38 . . reset by lever
 - H01H73/40 . . reset by tumbler
 - H01H73/42 . . reset by rotatable knob or wheel
 - H01H73/44 . . reset by push-button, pull-knob or slide
 - H01H73/46 . . reset by closure of switch casing

 - H01H73/48 . having both electrothermal and electromagnetic automatic release (cartridge type [H01H73/66](#))
 - H01H73/50 . . reset by lever
 - H01H73/52 . . reset by tumbler
 - H01H73/54 . . reset by rotatable knob or wheel
 - H01H73/56 . . reset by push-button, pull-knob or slide
 - H01H73/58 . . reset by closure of switch casing

 - H01H73/60 . Cartridge type, e.g. screw-in cartridge
 - H01H73/62 . . having only electrothermal release
 - H01H73/64 . . having only electromagnetic release
 - H01H73/66 . . having combined electrothermal and electromagnetic release

 - H01H75/00** **Protective overload circuit-breaking switches in which excess current opens the contacts by automatic release of mechanical energy stored by previous operation of power reset mechanism**

 - H01H75/02 . Details
 - H01H75/04 . . Reset mechanisms for automatically reclosing a limited number of times ([circuit arrangements H02H3/06](#))
 - H01H75/06 . . . effecting one reclosing action only

 - H01H75/08 . having only electrothermal release

 - H01H75/10 . having only electromagnetic release

 - H01H75/12 . having combined electrothermal and electromagnetic release

 - H01H77/00** **Protective overload circuit-breaking switches operated by excess current and requiring separate action for resetting ([H01H73/00](#), [H01H75/00](#) take precedence)**

 - H01H77/02 . in which the excess current itself provides the energy for opening the contacts, and having a separate reset mechanism
 - H01H77/04 . . with electrothermal opening

- H01H77/06 . . with electromagnetic opening [N: (combined with electromagnetic release mechanism [H01H71/24B](#))]
- H01H77/08 . . . retained closed by permanent or remanent magnetism and opened by windings acting in opposition
- H01H77/10 . . with electrodynamic opening [N: (combined with electromagnetic release mechanism [H01H71/24C](#))]
- H01H77/10B . . . [N: with increasing of contact pressure by electrodynamic forces before opening]
- H01H77/10C . . . [N: characterised by special mounting of contact arm, allowing blow-off movement] [N9508]
- H01H77/10C2 [N: with a stable blow-off position] [N9508]
- H01H77/10C4 [N: whereby the blow-off movement unlatches the contact from a contact holder] [N9508]
- H01H77/10D . . . [N: characterised by the blow-off force generating means, e.g. current loops][N9508]
- H01H77/10D2 [N: comprising magnetisable elements, e.g. flux concentrator, linear slot motor] [N9508]

- H01H79/00** **Protective switches in which excess current causes the closing of contacts, e.g. for short-circuiting the apparatus to be protected [N: ([H01H39/00C](#) takes precedence)] [C0002]**

- H01H81/00** **Protective switches in which contacts are normally closed but are repeatedly opened and reclosed as long as a condition causing excess current persists, e.g. for current limiting**
- H01H81/02 . electrothermally operated
- H01H81/04 . electromagnetically operated

- H01H83/00** **Protective switches, e.g. circuit-breaking switches, or protective relays operated by abnormal electrical conditions otherwise than solely by excess current**
- H01H83/02 . operated by earth fault currents ([H01H83/14](#) takes precedence)
- H01H83/04 . . with testing means for indicating the ability of the switch or relay to function properly
- H01H83/06 . operated by current falling below a predetermined value
- H01H83/08 . operated by reversal of dc
- H01H83/10 . operated by excess voltage, e.g. for lightning protection
- H01H83/12 . operated by voltage falling below a predetermined value, e.g. for no-volt protection
- H01H83/14 . operated by unbalance of two or more currents or voltages, e.g. for differential protection
- H01H83/14B . . [N: with bimetal elements]
- H01H83/14C . . [N: with differential transformer]

- H01H83/16 . operated by abnormal ratio of voltage and current, e.g. distance relay
- H01H83/18 . operated by abnormal product of, or abnormal phase angle between, voltage and current, e.g. directional relay
- H01H83/20 . operated by excess current as well as by some other abnormal electrical condition
- H01H83/22 . . the other condition being unbalance of two or more currents or voltages
- H01H83/22B . . . [N: with bimetal elements]
- H01H83/22C . . . [N: with differential transformer]

- H01H85/00** **Protective devices in which the current flows through a part of fusible material and this current is interrupted by displacement of the fusible material when this current becomes excessive** ([switches actuated by melting of fusible material H01H37/76](#); [automatic release of protective switches due to fusion of a mass H01H73/00 to H01H83/00](#); [disposition or arrangement of fuses on boards H02B1/18](#))

- H01H85/00D . [N: Means for preventing damage, e.g. by ambient influences to the fuse] [N0111]
- H01H85/00D3 . . [N: due to vibration or other mechanical forces, e.g. centrifugal forces] [N0111]
- H01H85/00D5 . . [N: water or dustproof devices] [N0111]
- H01H85/00D5A . . . [N: casings for the fuse and its base contacts] [N0111]
- H01H85/00D5C . . . [N: casings for the fusible element] [N0111]

- H01H85/00R . [N: Means for influencing the rupture process of the fusible element] [N0111]
- H01H85/00R3 . . [N: Boiling of a material associated with the fusible element, e.g. surrounding fluid] [N0111]
- H01H85/00R5 . . [N: Heating means] [N0111]
- H01H85/00R5A . . . [N: Fusible element and series heating means or series heat dams] [N0111]
- H01H85/00R5B . . . [N: Heat conducting or heat absorbing means associated with the fusible member, e.g. for providing time delay] [N0111]
- H01H85/00R5C . . . [N: Heat reflective or insulating layer on the casing or on the fuse support] [N0111]
- H01H85/00R5D . . . [N: Heat reflective or insulating layer on the fusible element] [N0111]
- H01H85/00R5E . . . [N: Heat reflective or insulating filler, support, or block forming the casing] [N0111]
- H01H85/00R7 . . [N: Expansion or rupture of the insulating support for the fusible element] [N0111]

- H01H85/00S . [N: Security-related arrangements] [N0111]
- H01H85/00S3 . . [N: preventing explosion of the cartridge] [N0111]
- H01H85/00S3A . . . [N: use of a flexible body, e.g. inside the casing] [N0111]
- H01H85/00S5 . . [N: providing disconnection of the neutral line] [N0111]
- H01H85/00S7 . . [N: Earthing means] [N0111]

- H01H85/02 . Details ([electrical connections in general H01R](#))
- H01H85/02C . . [N: Tools for inserting and removing fuses]

H01H85/02S	. . .	[N: Structural association of a fuse and another component or apparatus (switches with built-in fuses H01H9/10 , spark-gap arresters H01H85/44 , transformers and inductances H01F27/40A , capacitors H01G2/14 , lamps H01K1/66 , semiconductors H01L23/525F or H01L23/62)] [C0908]
H01H85/04	. . .	Fuses, i.e. expendable parts of the protective device, e.g. cartridges
H01H85/041	. . . .	characterised by the type
H01H85/041B	. . . . .	[N: Miniature fuses]
H01H85/041B6	. . . . .	[N: cartridge type]
H01H85/041B6B	. . . . .	[N: with parallel side contacts]
H01H85/041B6G	. . . . .	[N: with ferrule type end contacts]
H01H85/042	. . . . .	General constructions or structure of high voltage fuses, i.e. above 1000 V
H01H85/044	. . . . .	General constructions or structure of low voltage fuses, i.e. below 1000 V, or of fuses where the applicable voltage is not specified (H01H85/046 to H01H85/048 take precedence)
H01H85/0445	. . . . .	fast or slow type (H01H85/045 to H01H85/048 take precedence)
		[N: WARNING Not complete, see also H01H85/044]
H01H85/045	. . . . .	cartridge type
H01H85/045B	. . . . .	[N: with parallel side contacts]
H01H85/045D	. . . . .	[N: with screw-in type contacts]
H01H85/045E	. . . . .	[N: with knife-blade end contacts]
H01H85/045G	. . . . .	[N: with ferrule type end contacts]
H01H85/046	. . . . .	Fuses formed as printed circuits
H01H85/047	. . . . .	Vacuum fuses
H01H85/048	. . . . .	Fuse resistors
H01H85/05	. . . . .	Component parts thereof
H01H85/055	. . . . .	Fusible members
H01H85/06	. . . . .	characterised by the fusible material (H01H85/11 takes precedence)
H01H85/08	. . . . .	characterised by the shape or form of the fusible member
H01H85/10	. . . . .	with constriction for localised fusing (H01H85/11 takes precedence)
H01H85/11	. . . . .	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
H01H85/12	. . . . .	Two or more separate fusible members in parallel
H01H85/143	. . . . .	Electrical contacts; Fastening fusible members to such contacts
H01H85/147	. . . . .	Parallel-side contacts
H01H85/15	. . . . .	Screw-in contacts
H01H85/153	. . . . .	Knife-blade-end contacts
H01H85/157	. . . . .	Ferrule-end contacts
H01H85/165	. . . . .	Casings (electrical contacts H01H85/143 ; fillings H01H85/18)
H01H85/17	. . . . .	characterised by the casing material
H01H85/175	. . . . .	characterised by the casing shape or form
H01H85/175C	. . . . .	[N: composite casing]
H01H85/18	. . . . .	Casing fillings, e.g. powder

H01H85/18B	. . . . .	[N: Insulating members for supporting fusible elements inside a casing, e.g. for helically wound fusible elements]
H01H85/20	. .	Bases for supporting the fuse; Separate parts thereof (bases, casings for connectors, in general H01R)
H01H85/20B	. . .	[N: for use with screw-in type fuse]
H01H85/20C	. . .	[N: for connecting a fuse in a lead and adapted to be supported by the lead alone]
H01H85/20D	. . .	[N: for plug-in type fuses]
H01H85/20E	. . .	[N: for fuses with ferrule type end contacts]
H01H85/20F	. . .	[N: for fuses with conical end contacts, e.g. fuses used on motor vehicles]
H01H85/20H	. . .	[N: for fuses with blade type terminals]
H01H85/20H1	. . . .	[N: for miniature fuses with parallel side contacts] [N9911]
H01H85/20H5	. . . .	[N: for low voltage fuses with knife-blade end contacts] [N9911]
H01H85/20K	. . .	[N: Mounting means or insulating parts of the base, e.g. covers, casings]
H01H85/20L	. . .	[N: Electric connections to contacts on the base]
H01H85/22	. .	Intermediate or auxiliary parts for carrying, holding, or retaining fuse, cooperating with base or fixed holder, and removable therefrom for renewing the fuse
H01H85/24	. .	Means for preventing insertion of incorrect fuse
H01H85/25	. .	Safety arrangements preventing or inhibiting contact with live parts, including operation of isolation on removal of cover (interlocking between casing or protective shutter of a switch and mechanism for operating its contacts H01H9/22)
H01H85/26	. .	Magazine arrangements
H01H85/26B	. . .	[N: with spare printed circuit fuse]
H01H85/28	. . .	effecting automatic replacement
H01H85/30	. .	Means for indicating condition of fuse structurally associated with the fuse
H01H85/30B	. . .	[N: Movable indicating elements]
H01H85/30B1	. . . .	[N: acting on an auxiliary switch or contact]
H01H85/32	. . .	Indicating lamp structurally associated with the protective device
H01H85/34	. .	Distinguishing marks, e.g. colour coding
H01H85/36	. .	Means for applying mechanical tension to fusible member
H01H85/38	. .	Means for extinguishing or suppressing arc (by powder filling H01H85/18 ; by mechanical tension applied to fusible member H01H85/36)
H01H85/40	. . .	using an arc-extinguishing liquid (characterised by the composition of the liquid H01H33/22)
H01H85/42	. . .	using an arc-extinguishing gas (characterised by the composition of the gas H01H33/22)
H01H85/43	. .	Means for exhausting or absorbing gases liberated by fusing arc, or for ventilating excess pressure generated by heating
H01H85/44	. .	Structural association with a spark-gap arrester
H01H85/46	. .	Circuit arrangements not adapted to a particular application of the protective device
H01H85/46B	. . .	[N: with printed circuit fuse]
H01H85/47	. .	Means for cooling
H01H85/48	. .	Protective devices wherein the fuse is carried or held directly by the base
H01H85/48B	. .	[N: the fuse being provided with bayonet-type locking means]

- H01H85/50 . . the fuse having contacts at opposite ends for co-operation with the base
- H01H85/52 . . the fuse being adapted for screwing into the base
- H01H85/54 . Protecting devices wherein the fuse is carried, held or retained by an intermediate or auxiliary part removable from the base, or used as sectionalisers [C9606]
- H01H85/54B . . [N: the intermediate or auxiliary part being provided with bayonet-type locking means]
- H01H85/54C . . [N: with pivoting fuse carrier (tumbler switch with built-in fuse H01H23/10)]
- H01H85/54D . . [N: with sliding fuse carrier]
- H01H85/56 . . the intermediate or auxiliary part having side contacts for plugging into the base, e.g. bridge-carrier type
- H01H85/58 . . . with intermediate or auxiliary part and base shaped to interfit and thereby enclose the fuse
- H01H85/60 . . the intermediate or auxiliary part having contacts at opposite ends for co-operation with the base
- H01H85/62 . . the intermediate or auxiliary part being adapted for screwing into the base

- H01H87/00** **Protective devices in which a current flowing through a liquid or solid is interrupted by the evaporation of the liquid or by the melting and evaporation of the solid when the current becomes excessive, the circuit continuity being reestablished on cooling [C9606]**

- H01H89/00** **Combinations of two or more different basic types of electric switches, relays, selectors and emergency protective devices, not covered by a single one of the preceding main groups [N0503]**
- H01H89/02 . Combination of a key operated switch with a manually operated switch, e.g. ignition and lighting switches [N0503]
- H01H89/04 . Combination of a thermally actuated switch with a manually operated switch [N0503]
- H01H89/06 . 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 [N0503]
- H01H89/08 . . with both devices using the same contact pair [N0503]
- H01H89/10 . . . with each device controlling one of the two [N0503]