ECLA EUROPEAN CLASSIFICATION

G04C ELECTROMECHANICAL CLOCKS OR WATCHES (mechanical parts of clocks or watches in general G04B; electronic time-pieces with no moving parts, electronic circuitry for producing timing pulses G04G)

Note
This subclass covers electric features of mechanically-driven clocks or watches, such as electric winding of such clocks or the provision of electric contacts thereon.

Guide heading: **Electric winding of mechanical clocks; Independent electric clocks or watches**

G04C1/00 **Winding mechanical clocks electrically** (winding mechanically G04B3/00 [N: electrical winding of spring driven arrangements for grammophones G11B19/20])

G04C1/00B . [N: by electro-thermal or electro-pneumatic arrangements]

G04C1/00F . [N: for clocksystems (G04C1/02 to G04C1/04 take precedence)]

G04C1/02 . by electromagnets
G04C1/02B . . [N: with snap-acting armature]
G04C1/02B2 . . . [N: winding-up springs]
G04C1/02C . . [N: having unipolar rotating armature (two-pole or multi-pole arrangements G04C1/04, G04C1/06, G04C1/08)]
G04C1/02D . . [N: with linearly moving armature]

G04C1/04 . by electric motors with rotating or with reciprocating movement [N: (in general H02K33/00)]
G04C1/06 . . winding-up springs
G04C1/06B . . . [N: by oscillating movement]
G04C1/06C . . . [N: by continuous rotating movement]
G04C1/06D . . . [N: by stepping rotating movement]
G04C1/08 . . raising weights
G04C1/08B . . . [N: by oscillating movement]
G04C1/08C . . . [N: by continuously rotating movement]
G04C1/08D . . . [N: by stepping rotating movement]

G04C1/10 . Protection against overwinding (in mechanical clocks or watches G04B1/20, G04B3/06, G04B3/10; [N: G04B5/24, G04B9/02])
G04C1/12 . . of the spring
G04C1/14 . . of the weights

G04C3/00 **Electromechanical clocks or watches independent of other time-pieces and in which the movement is maintained by electric means** [N: Synchronisation G04C11/00]

G04C3/00K . [N: Electromechanical switches for setting or display (in general H01H)]

G04C3/00K2 . . [N: Position, e.g. inclination dependent switches]

[N: **WARNING**
Not complete. See also G04C3/00K
]

G04C3/00K3 . . [N: Magnetically controlled]

[N: **WARNING**
Not complete. See also G04C3/00K, G04C3/00K4
]

G04C3/00K4 . . [N: Multiple switches (G04C3/00K3 takes precedence)]

G04C3/00K5 . . [N: Electromechanical contact-making and breaking devices acting as pulse generators for setting]

G04C3/00M . [N: Mounting, assembling of components]

G04C3/02 . wherein movement is regulated by a pendulum

G04C3/02B . . [N: using mechanical coupling (using more than one pendulum G04C3/02K; using torsion pendulums G04C3/033; using conical pendulums G04C3/033B)]

G04C3/02B2 . . . [N: with constant impulses]

G04C3/02D . . [N: using other coupling means, e.g. electrostrictive, magnetostrictive]

G04C3/02K . . [N: using more than one pendulum (synchronisation between master and slave pendulums G04C13/02K)]

G04C3/027 . . using electro-magnetic coupling between electric power source and pendulum (G04C3/033 takes precedence)

G04C3/027B . . . [N: the pendulum controlling contacts and mechanically driving the gear-train (constructional details of contact devices G04C13/06, G04C23/06)]

G04C3/027C . . . [N: the pendulum controlling contacts, thereby electromagnetically driving the gear-train or several gear-trains (generating driving pulses in master-clocks G04C13/04D)]

G04C3/027D . . . [N: the pendulum controlling contacts, the pendulum driving electro-magnet simultaneously driving the gear-train]

G04C3/027E . . . [N: the pendulum controlling indirectly, i.e. without mechanical connection, contacts, e.g. by magnetic or optic means]

G04C3/027F . . . [N: the pendulum controlling the gear-train by means of static switches, e.g. transistor circuits]

G04C3/033 . . using torsion pendulums; using conical pendulums (construction thereof G04B17/00)

G04C3/033B . . . [N: using conical pendulums (construction thereof G04B17/30)]

G04C3/04 . wherein movement is regulated by a balance [N: construction thereof G04B17/06B]

G04C3/04B . . [N: using mechanical coupling]

G04C3/04B2 . . . [N: with constant impulses]

G04C3/04D . . [N: using other coupling means, e.g. electrostrictive, magnetostrictive]

G04C3/06 . . using electro-magnetic coupling between electric power source and balance

G04C3/06B . . . [N: the balance controlling contacts and mechanically driving the gear-train]

G04C3/06C . . . [N: the balance controlling contacts, the gear-train or several gear-trains being

driven electro-magnetically thereby]

G04C3/06D . . . [N: the balance controlling contacts, the balance driving electro-magnet simultaneously driving the gear-train]

G04C3/06E . . . [N: the balance controlling indirectly, i.e. without mechanical connection, contacts, e.g. by magnetic or optic means]

G04C3/06F . . . [N: the balance controlling gear-train by means of static switches, e.g. transistor circuits (synchronisation of balance G04C11/08K6)]

G04C3/06F2 . . . . [N: Constructional details, e.g. disposition of coils]

G04C3/06F3 . . . . [N: Driving circuits with distinct detecting and driving coils]

G04C3/06F3B . . . . . [N: provided with automatic control]

G04C3/06F4 . . . . [N: Driving circuits using a single coil for detection and driving purposes]

G04C3/08 . wherein movement is regulated by a mechanical oscillator other than a pendulum or balance, e.g. by a tuning fork, [N: e.g. electrostatically]

G04C3/10 . . driven by electro-magnetic means

G04C3/10B . . . [N: constructional details]

G04C3/10B2 . . . . [N: of the mechanical oscillator or of the coil]

G04C3/10B3 . . . . [N: of the pawl or the ratched-wheel (in general G04B11/04, G04C11/00C)]

G04C3/10B3B . . . . . [N: pawl and ratched-wheel being magnetically coupled]

G04C3/10B4 . . . . [N: Controlling frequency or amplitude of the oscillating system (circuits G04C3/10C)]

G04C3/10C . . . [N: Driving circuits]

G04C3/12 . . driven by piezo-electric means; driven by magneto-strictive means

G04C3/12B . . . [N: driven by magneto-strictive means]

G04C3/14 . incorporating a stepping motor (G04C3/02 to G04C3/12 take precedence [N: generating timing pulses G04F5/00, G04G3/00; setting G04G5/00; synchronisation G04C11/00K, G04G7/00; generating commutating pulses in masterclocks G04C13/04D, G04C13/02; slave clocks actuated intermittently by electromechanical step advancing mechanisms G04C13/10; control circuits for stepping motors in general H02P8/00])

G04C3/14B . . [N: Means to reduce power consumption by reducing pulse width or amplitude and related problems e.g. detection of unwanted or missing step]

G04C3/14C . . [N: incorporating two or more stepping motors or rotors]

G04C3/16 . incorporating an electro-dynamic continuously rotating motor (G04C3/02 to G04C3/12 take precedence; clocks driven by synchronous motors G04C15/00; [N: apparatus which can be set and started to measure-off predetermined or adjustably-fixed time intervals with electric driving means, e.g. incorporating clocks G04F3/06, G04F3/08; electromechanical stop watches G04F8/00])

G04C3/16B . . [N: comprising a mechanical regulating device influencing the electromotor (constructional details of the mechanical regulating device G04B 17/00)]

G04C3/18 . incorporating electro-thermal or electro-pneumatic driving means

G04C5/00 **Electric or magnetic means for converting oscillatory to rotary motion in time-pieces, i.e. electric or magnetic escapements** (regulators G04C3/00)

G04C5/00B . [N: Magnetic or electromagnetic means]

G04C9/00 **Electrically-actuated devices for setting the time-indicating means** (of slave clocks G04C13/03; mechanical setting devices G04B27/00; radio-controlled time-pieces G04R) [N1208]

G04C9/02 . brought into action by radio transmission

[N: **WARNING** [N1208]
This group is no longer used for the classification of new documents as from September 1, 2012 The backlog of this group is being continuously reclassified to subgroups of G04R
]

G04C9/04 . by blocking the driving means [N: see provisionally G04C9/00]

G04C9/06 . by decoupling the driving means (combined with blocking means G04C9/04) [N: see provisionally G04C9/00]

G04C9/08 . by electric drive, [N: i.e. for mechanical clocks; see provisionally G04C9/00]

G04C10/00 **Arrangements of electric power supplies in time pieces** [N: (circuits G04G19/00; mounting, assembling of components of electromechanical watches G04C3/00M, of electronic watches G04G17/00)] [C1005]

G04C10/02 . the power supply being a radioactive [N: or photovoltaic] source

G04C10/04 . with means for indicating the condition of the power supply [N: in general G01R31/00B]

Guide heading: **Electric clock installations; Master-and-slave clock systems; Synchronous-motor clocks**

G04C11/00 **Synchronisation of independently-driven clocks (radio-controlled time-pieces G04R)** [N1208]

G04C11/00B . [N: by changing the driving speed]

G04C11/00C . [N: by changing the ratio of the driving-gear]

G04C11/00H . [N: by positioning of the index or by regulating the length of the pendulum in dependance on the time difference with a standard]

G04C11/02 . by radio [N: time setting brought into action by radio G04C9/02]

[N: **WARNING** [N1208]
This group and subgroups are no longer used for the classification of new documents as from September 1, 2012 The backlog of this group and subgroups are being continuously reclassified to subgroups of G04R
]

G04C11/02B . . [N: provided with arrangements to prevent synchronisation by interfering signals]

G04C11/02C . . [N: the time-piece preparing itself on set times on the reception of the sychronising

signal]

G04C11/04 . over a line (transmitting time signals over telephone networks H04M11/06) [N: time setting G04C9/00]

G04C11/04B . . [N: provided with arrangements to prevent synchronisation by interfering signals]

G04C11/04C . . [N: the time-piece preparing itself on set time on the reception of the synchronising signal]

G04C11/06 . with direct mechanical action on the time-indicating means [N: time setting G04C9/00]

G04C11/08 . using an electro-magnet or-motor [N: for oscillation correction]

G04C11/08K . . [N: using an electro-magnet]

G04C11/08K5 . . . [N: acting on the pendulum (mutual synchronisation of pendulums G04C13/02K)]

G04C11/08K6 . . . [N: acting on the balance]

G04C11/08M . . [N: using an electro-motor]

G04C11/08M5 . . . [N: acting on the pendulum (mutual synchronisation of pendulums G04C13/02K)]

G04C11/08M6 . . . [N: acting on the balance]

G04C13/00 Driving mechanisms for clocks by master-clocks

G04C13/02 . Circuit arrangements; Electric clock installations

G04C13/02B . . [N: master-slave systems using transmission of singular pulses for driving directly slave-clocks step by step (G04C13/03 takes precedence)]

G04C13/02B2 . . . [N: via existing power distribution lines]

G04C13/02B3 . . . [N: via existing transmission lines (transmitting time signals over telephone networks H04M11/06)]

G04C13/02B4 . . . [N: via special lines]

G04C13/02B5 . . . [N: by radio]

G04C13/02F . . [N: master-slave systems using transmission of other driving signals, e.g. coded signals]

G04C13/02K . . [N: transmission systems for synchronisation of pendulum of slave-clocks by pendulums of master-clocks]

G04C13/03 . . Pulse transmission systems with additional means for setting the time indication of slave-clocks [N: G04C13/02K takes precedence]

G04C13/04 . . Master-clocks

G04C13/04B . . . [N: monitoring or controlling master-clock or system with more than one master-clock, e.g. for switching-over to standby motor or power system]

G04C13/04B2 . . . . [N: by using devices similar to slave-clocks]

G04C13/04B3 . . . . [N: Systems in which slave-clocks function as master-clocks for other slave-clocks (synchronisation of independently-driven clocks G04C11/00, setting G04C9/00)]

G04C13/04C . . . [N: provided with supplementary means for setting or changing the time indication of the slave-clocks]

G04C13/04C2 . . . . [N: for automatically correcting of or compensating for disturbances]

G04C13/04C3 . . . . [N: for automatically setting of slave-clocks after correction or after setting of master-clock]

G04C13/04D . . . [N: Arrangements for generating normal driving pulses]
G04C13/04D2 . . . . [N: by starting an independent mechanical driving devices, e.g. motor controlling the contacts]
G04C13/04D3 . . . . [N: by switching on an electromagnetic driving device, e.g. electro-motor, controlling the contacts]
G04C13/04D4 . . . . [N: by using current generating driving device]
G04C13/06 . . . Contact devices (for simultaneously winding several clocks G04C1/00)
G04C13/06B . . . . [N: controlled by a pendulum or a balance]

G04C13/08 . Slave-clocks actuated intermittently
G04C13/10 . . by electromechanical step advancing mechanisms [N: independent clocks or watches incorporating a stepping motor G04C3/14; stepping motors in general H02K33/00]
G04C13/10C . . . [N: setting the time-indicating means (master-slave systems with setting means G04C13/03; adjusting independently-driven clocks G04C9/00, G04C11/00)]
G04C13/11 . . . with rotating armature
G04C13/12 . . by continuously-rotating electric motors [N: independent clocks G04C3/16; clocks driven by synchronous motors G04C15/00]
G04C13/14 . . by electrically-released mechanical driving mechanisms

G04C15/00 **Clocks driven by synchronous motors**

G04C15/00B . [N: without power-reserve]
G04C15/00B2 . . [N: provided with hand-actuated starting device]
G04C15/00B3 . . [N: provided with automatic-starting device]
G04C15/00B4 . . [N: provided with means for indicating disturbance]
G04C15/00B5 . . [N: provided with means for checking sense of rotation]

G04C15/00C . [N: with power-reserve]

G04C15/00H . [N: Synchronous clock systems, e.g. provided with radiolink or using transmission of alternating current via existing power distribution lines]
G04C15/00H2 . . [N: Setting the time-indicating means, e.g. by controlling the frequency or by changing the drive of the separate clocks by using an auxiliary motor]
G04C15/00H3 . . [N: Automatic stabilisation of net frequency with regard to time, e.g. by comparing one of the clocks with an independent clock, means being provided for automatic compensation of disturbances]

G04C15/00T . [N: Lubricating]

Guide heading: **Indicating the time or producing time signals electrically**

G04C17/00 **indicating the time optically by electric means** (G04C19/00 takes precedence; by mechanical means G04B19/00, G04B19/20)

G04C17/00B . [N: by bands]
G04C17/00B2 . . [N: with date indication]

G04C17/00F . [N: by flaps]
G04C17/00F2 . . [N: with date indication]

G04C17/00K . [N: by a combination of different types of indicating devices, e.g. flaps and drums]

G04C17/00S . [N: by discs (by drums G04C17/00T)]
G04C17/00S2 . . [N: with date indication]
G04C17/00S2B . . . [N: electromagnetically driven, e.g. intermittently (clocks incorporating a stepping motor G04C3/14)]

G04C17/00T . [N: by drums or drum-like devices]
G04C17/00T2 . . [N: with date indication]

G04C17/00V . [N: Combined electro-optical and electro-mechanical displays (see provisionally also G04G9/00H)]

G04C17/02 . by electric lamps

G04C19/00 **Producing optical time signals at prefixed times by electric means**

G04C19/02 . by electric lamps

G04C19/04 . by indicating members moved electrically, e.g. flap, band

G04C21/00 **Producing acoustic time signals by electrical means** [N: (for mechanical clocks or watches G04B21/08, G04B25/00)]

G04C21/02 . Constructional details (G04C21/04, G04C21/16 take precedence) [N: sound producing devices in general G10K, e.g. G10K1/00]

G04C21/04 . Indicating the time of the day (acoustic indication of time G04B21/00)
G04C21/06 . . by striking mechanism
G04C21/08 . . . with snail
G04C21/10 . . . with locking plate
G04C21/12 . . by electro-acoustic means
G04C21/14 . . . Electro-acoustic time announcement, i.e. spoken

G04C21/16 . producing the signals at adjustable fixed times
G04C21/18 . . by mechanically unlocking an electro-mechanical vibrator, e.g. actuated by the leakage flux of the electric driving means
G04C21/18F . . . [N: provided with means for sheeting off or temporarity stopping the signal]
G04C21/20 . . by closing a contact to ring an electro-mechanical alarm
G04C21/20B . . . [N: by the hand(s) or handlike members closing the contact]
G04C21/22 . . . put into action by the arbor of a mechanical alarm work
G04C21/24 . . . put into action by the spring of a mechanical alarm work
G04C21/26 . . . put into action by the vibrations caused by the operation of a mechanical alarm work

G04C21/28 . . by closing a contact to put into action electro-acoustic means, e.g. awakening by music

G04C21/30 . . with provision for a number of operations at different times, e.g. ringing the bells in a school

G04C21/30B . . . [N: by the hand(s) or handlike members closing the contacts]

G04C21/32 . . . giving indications at a number of places each at a different time, e.g. system of alarms in a hotel

G04C21/32B . . . . [N: by the hand(s) or handlike members closing the contacts]

G04C21/32K . . . . [N: adjustable from the different places themselves]

G04C21/34 . . Devices on watches or similar portable timepieces

G04C21/36 . . Signal repeating devices

G04C21/38 . . Adjusting the duration of signals

G04C23/00 **Clocks with attached or built-in means operating any device at preselected times or after preselected time-intervals** (if restricted to producing acoustic time signals by electrical means G04C21/00; mechanical alarm clocks G04B23/02; apparatus which can be set and started to measure-off predetermined intervals G04F3/06; time or time-programme switches which automatically terminate their operation after the programme is completed H01H43/00)

G04C23/02 . Constructional details

G04C23/04 . . Housings, supports, shielding, or similar stationary parts

G04C23/06 . . Driving or regulating means

G04C23/08 . . Programming means

G04C23/10 . . for actuating any element which operates, or initiates the operation of, the device concerned

G04C23/12 . . Electric circuitry

G04C23/14 . Mechanisms continuously running to relate the operation(s) to the time of day

G04C23/16 . . acting only at one preselected time or during one adjustable time interval

G04C23/18 . . for operating one device at a number of different times

G04C23/20 . . . with contacts operated, or formed by clock hands or elements of similar form

G04C23/22 . . . with the actuating element carried by a disc

G04C23/24 . . . . the actuating element controlling another element mechanically

G04C23/26 . . for operating a number of devices at different times

G04C23/28 . . . with contacts operated, or formed, by clock hands or elements of similar form

G04C23/30 . . . with the actuating element carried by a disc

G04C23/32 . . . . the actuating element controlling another element mechanically

G04C23/34 . . with provision for automatic modification of the programme, e.g. on Sunday

G04C23/34G . . . [N: some operations being performed at another time]

G04C23/34H . . . [N: another programme being carried out]

G04C23/34M . . . [N: some operations being overridden]

G04C23/36 . . . by external influences

G04C23/38 . Mechanisms measuring a chosen time interval independently of the time of day at which interval starts

G04C23/40	. . using continuously-running mechanism
G04C23/42	. . acting only at the end of a single time interval
G04C23/44	. . . with provision for selection from a number of preset intervals
G04C23/46	. . . with provision for adjustment of the interval (G04C23/44 takes precedence)
G04C23/48	. . acting at the ends of successive time intervals
G04C23/50	. . with provision for modification of the interval(s) by external influences

G04C99/00 **Subject matter not provided for in other groups of this subclass** [N0704]