

CPC COOPERATIVE PATENT CLASSIFICATION

G PHYSICS (NOTES omitted)

INSTRUMENTS

G04 HOROLOGY

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.

WARNING

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

Electric winding of mechanical clocks; Independent electric clocks or watches

- 1/00** **Winding mechanical clocks electrically** (winding mechanically G04B 3/00 {; electrical winding of spring driven arrangements for grammophones G11B 19/20})
- 1/003 . {by electro-thermal or electro-pneumatic arrangements}
- 1/006 . {for clocksystems (G04C 1/02 - G04C 1/04 take precedence)}
- 1/02 . by electromagnets
- 1/022 . . {with snap-acting armature}
- 1/024 . . . {winding-up springs}
- 1/026 . . {having unipolar rotating armature (two-pole or multi-pole arrangements G04C 1/04, G04C 1/06, G04C 1/08)}
- 1/028 . . {with linearly moving armature}
- 1/04 . by electric motors with rotating or with reciprocating movement {(in general H02K 33/00)}
- 1/06 . . winding-up springs
- 1/062 . . . {by oscillating movement}
- 1/065 . . . {by continuous rotating movement}
- 1/067 . . . {by stepping rotating movement}
- 1/08 . . raising weights
- 1/082 . . . {by oscillating movement}
- 1/085 . . . {by continuously rotating movement}
- 1/087 . . . {by stepping rotating movement}
- 1/10 . Protection against overwinding (in mechanical clocks or watches G04B 1/20, G04B 3/06, G04B 3/10; {G04B 5/24, G04B 9/02})
- 1/12 . . of the spring
- 1/14 . . of the weights
- 3/00** **Electromechanical clocks or watches independent of other time-pieces and in which the movement is maintained by electric means** {(synchronisation G04C 11/00)}

- 3/001 . {Electromechanical switches for setting or display (in general H01H)}
- 3/002 . . {Position, e.g. inclination dependent switches}
- 3/004 . . {Magnetically controlled}
- 3/005 . . {Multiple switches (G04C 3/004 takes precedence)}
- 3/007 . . {Electromechanical contact-making and breaking devices acting as pulse generators for setting}
- 3/008 . {Mounting, assembling of components}
- 3/02 . wherein movement is regulated by a pendulum
- 3/021 . . {using mechanical coupling (using more than one pendulum G04C 3/025; using torsion pendulums G04C 3/033; using conical pendulums G04C 3/0335)}
- 3/022 . . . {with constant impulses}
- 3/024 . . {using other coupling means, e.g. electrostrictive, magnetostrictive}
- 3/025 . . {using more than one pendulum (synchronisation between master and slave pendulums G04C 13/028)}
- 3/027 . . using electromagnetic coupling between electric power source and pendulum (G04C 3/033 takes precedence)
- 3/0271 . . . {the pendulum controlling contacts and mechanically driving the gear-train (constructional details of contact devices G04C 13/06, G04C 23/06)}
- 3/0273 . . . {the pendulum controlling contacts, thereby electromagnetically driving the gear-train or several gear-trains (generating driving pulses in master-clocks G04C 13/0463)}
- 3/0275 . . . {the pendulum controlling contacts, the pendulum driving electro-magnet simultaneously driving the gear-train}
- 3/0276 . . . {the pendulum controlling indirectly, i.e. without mechanical connection, contacts, e.g. by magnetic or optic means}

- 3/0278 . . . {the pendulum controlling the gear-train by means of static switches, e.g. transistor circuits}
- 3/033 . . . using torsion pendulums; using conical pendulums (construction thereof G04B 17/00)
- 3/0335 . . . {using conical pendulums (construction thereof G04B 17/30)}
- 3/04 . . wherein movement is regulated by a balance {(construction thereof G04B 17/063)}
- 3/042 . . {using mechanical coupling}
- 3/045 . . . {with constant impulses}
- 3/047 . . {using other coupling means, e.g. electrostrictive, magnetostrictive}
- 3/06 . . using electromagnetic coupling between electric power source and balance
- 3/061 . . . {the balance controlling contacts and mechanically driving the gear-train}
- 3/062 . . . {the balance controlling contacts, the gear-train or several gear-trains being driven electro-magnetically thereby}
- 3/063 . . . {the balance controlling contacts, the balance driving electro-magnet simultaneously driving the gear-train}
- 3/064 . . . {the balance controlling indirectly, i.e. without mechanical connection, contacts, e.g. by magnetic or optic means}
- 3/065 . . . {the balance controlling gear-train by means of static switches, e.g. transistor circuits (synchronisation of balance G04C 11/084)}
- 3/066 {Constructional details, e.g. disposition of coils}
- 3/067 {Driving circuits with distinct detecting and driving coils}
- 3/068 {provided with automatic control}
- 3/069 {Driving circuits using a single coil for detection and driving purposes}
- 3/08 . . wherein movement is regulated by a mechanical oscillator other than a pendulum or balance, e.g. by a tuning fork {, e.g. electrostatically}
- 3/10 . . driven by electromagnetic means
- 3/101 . . . {constructional details}
- 3/102 {of the mechanical oscillator or of the coil}
- 3/104 {of the pawl or the ratched-wheel (in general G04B 11/04, G04C 11/005)}
- 3/105 {pawl and ratched-wheel being magnetically coupled}
- 3/107 {Controlling frequency or amplitude of the oscillating system (circuits G04C 3/108)}
- 3/108 . . . {Driving circuits}
- 3/12 . . driven by piezoelectric means; driven by magneto-strictive means
- 3/125 . . . {driven by magneto-strictive means}
- 3/14 . . incorporating a stepping motor (G04C 3/02 - G04C 3/12 take precedence {generating timing pulses G04F 5/00, G04G 3/00; setting G04G 5/00; synchronisation G04G 7/00; generating commutating pulses in masterclocks G04C 13/0463, G04C 13/02; slave clocks actuated intermittently by electromechanical step advancing mechanisms G04C 13/10; control circuits for stepping motors in general H02P 8/00})
- 3/143 . . {Means to reduce power consumption by reducing pulse width or amplitude and related problems, e.g. detection of unwanted or missing step}
- 3/146 . . {incorporating two or more stepping motors or rotors}
- 3/16 . . incorporating an electro-dynamic continuously rotating motor (G04C 3/02 - G04C 3/12 take precedence; clocks driven by synchronous motors G04C 15/00; {apparatus which can be set and started to measure-off predetermined or adjustably-fixed time intervals with electric driving means, e.g. incorporating clocks G04F 3/06, G04F 3/08; electromechanical stop watches G04F 8/00})
- 3/165 . . {comprising a mechanical regulating device influencing the electromotor (constructional details of the mechanical regulating device G04B 17/00)}
- 3/18 . . incorporating electro-thermal or electro-pneumatic driving means
- 5/00 Electric or magnetic means for converting oscillatory to rotary motion in time-pieces, i.e. electric or magnetic escapements (regulators G04C 3/00)**
- 5/005 . . {Magnetic or electromagnetic means}
- 9/00 Electrically-actuated devices for setting the time-indicating means (of slave clocks G04C 13/03; mechanical setting devices G04B 27/00; radio-controlled time-pieces G04R)**
- 9/02 . . {brought into action by radio transmission}
- 9/04 . . by blocking the driving means {(see provisionally G04C 9/00)}
- 9/06 . . by decoupling the driving means (combined with blocking means G04C 9/04 {see provisionally G04C 9/00})
- 9/08 . . by electric drive, {(i.e. for mechanical clocks; see provisionally G04C 9/00)}
- 10/00 Arrangements of electric power supplies in time pieces {(circuits G04G 19/00; mounting, assembling of components of electromechanical watches G04C 3/008, of electronic watches G04G 17/00)}**
- 10/02 . . the power supply being a radioactive {or photovoltaic} source
- 10/04 . . with means for indicating the condition of the power supply {(in general G01R 31/36)}
- Electric clock installations; Master-and-slave clock systems; Synchronous-motor clocks**
- 11/00 Synchronisation of independently-driven clocks (radio-controlled time-pieces G04R)**
- 11/002 . . {by changing the driving speed}
- 11/005 . . {by changing the ratio of the driving-gear}
- 11/007 . . {by positioning of the index or by regulating the length of the pendulum in dependance on the time difference with a standard}
- 11/02 . . {by radio (time setting brought into action by radio G04C 9/02)}
- 11/023 . . {provided with arrangements to prevent synchronisation by interfering signals}
- 11/026 . . {the time-piece preparing itself on set times on the reception of the synchronising signal}
- 11/04 . . over a line (transmitting time signals over telephone networks H04M 11/06 {; time setting G04C 9/00})

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| 11/043 | . . {provided with arrangements to prevent synchronisation by interfering signals} | 13/06 | . . . Contact devices (for simultaneously winding several clocks G04C 1/00) |
| 11/046 | . . {the time-piece preparing itself on set time on the reception of the synchronising signal} | 13/065 | {controlled by a pendulum or a balance} |
| 11/06 | . with direct mechanical action on the time-indicating means {(time setting G04C 9/00)} | 13/08 | . Slave-clocks actuated intermittently |
| 11/08 | . using an electro-magnet or-motor {for oscillation correction} | 13/10 | . . by electromechanical step advancing mechanisms {(independent clocks or watches incorporating a stepping motor G04C 3/14 ; stepping motors in general H02K 33/00)} |
| 11/081 | . . {using an electro-magnet} | 13/105 | . . . {setting the time-indicating means (master-slave systems with setting means G04C 13/03 ; adjusting independently-driven clocks G04C 9/00 , G04C 11/00)} |
| 11/082 | . . . {acting on the pendulum (mutual synchronisation of pendulums G04C 13/028)} | 13/11 | . . . with rotating armature |
| 11/084 | . . . {acting on the balance} | 13/12 | . . by continuously-rotating electric motors {(independent clocks G04C 3/16 ; clocks driven by synchronous motors G04C 15/00)} |
| 11/085 | . . {using an electro-motor} | 13/14 | . . by electrically-released mechanical driving mechanisms |
| 11/087 | . . . {acting on the pendulum (mutual synchronisation of pendulums G04C 13/028)} | | |
| 11/088 | . . . {acting on the balance} | | |
| 13/00 | Driving mechanisms for clocks by master-clocks | 15/00 | Clocks driven by synchronous motors |
| 13/02 | . Circuit arrangements; Electric clock installations | 15/0009 | . {without power-reserve} |
| 13/021 | . . {master-slave systems using transmission of singular pulses for driving directly slave-clocks step by step (G04C 13/03 takes precedence)} | 15/0018 | . . {provided with hand-actuated starting device} |
| 13/022 | . . . {via existing power distribution lines} | 15/0027 | . . {provided with automatic-starting device} |
| 13/023 | . . . {via existing transmission lines (transmitting time signals over telephone networks H04M 11/06)} | 15/0036 | . . {provided with means for indicating disturbance} |
| 13/025 | . . . {via special lines} | 15/0045 | . . {provided with means for checking sense of rotation} |
| 13/026 | . . . {by radio} | 15/0054 | . {with power-reserve} |
| 13/027 | . . {master-slave systems using transmission of other driving signals, e.g. coded signals} | 15/0063 | . {Synchronous clock systems, e.g. provided with radiolink or using transmission of alternating current via existing power distribution lines} |
| 13/028 | . . {transmission systems for synchronisation of pendulum of slave-clocks by pendulums of master-clocks} | 15/0072 | . . {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} |
| 13/03 | . . Pulse transmission systems with additional means for setting the time indication of slave-clocks {(G04C 13/028 takes precedence)} | 15/0081 | . . {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} |
| 13/04 | . . Master-clocks | 15/009 | . {Lubricating} |
| 13/0409 | . . . {monitoring or controlling master-clock or system with more than one master-clock, e.g. for switching-over to standby motor or power system} | | |
| 13/0418 | {by using devices similar to slave-clocks} | | |
| 13/0427 | {Systems in which slave-clocks function as master-clocks for other slave-clocks (synchronisation of independently-driven clocks G04C 11/00 , setting G04C 9/00)} | | |
| 13/0436 | . . . {provided with supplementary means for setting or changing the time indication of the slave-clocks} | | |
| 13/0445 | {for automatically correcting of or compensating for disturbances} | | |
| 13/0454 | {for automatically setting of slave-clocks after correction or after setting of master-clock} | | |
| 13/0463 | . . . {Arrangements for generating normal driving pulses} | | |
| 13/0472 | {by starting an independent mechanical driving devices, e.g. motor controlling the contacts} | | |
| 13/0481 | {by switching on an electromagnetic driving device, e.g. electro-motor, controlling the contacts} | | |
| 13/049 | {by using current generating driving device} | | |
| | | Indicating the time or producing time signals electrically | |
| | | 17/00 | Indicating the time optically by electric means (G04C 19/00 takes precedence; by mechanical means G04B 19/00, G04B 19/20) |
| | | 17/0008 | . {by bands} |
| | | 17/0016 | . . {with date indication} |
| | | 17/0025 | . {by flaps} |
| | | 17/0033 | . . {with date indication} |
| | | 17/0041 | . {by a combination of different types of indicating devices, e.g. flaps and drums} |
| | | 17/005 | . {by discs (by drums G04C 17/0075)} |
| | | 17/0058 | . . {with date indication} |
| | | 17/0066 | . . . {electromagnetically driven, e.g. intermittently (clocks incorporating a stepping motor G04C 3/14)} |
| | | 17/0075 | . {by drums or drum-like devices} |
| | | 17/0083 | . . {with date indication} |
| | | 17/0091 | . {Combined electro-optical and electro-mechanical displays (see provisionally also G04G 9/0082)} |
| | | 17/02 | . by electric lamps |
| | | 19/00 | Producing optical time signals at prefixed times by electric means |

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| 19/02 | • by electric lamps | 23/10 | • . . for actuating any element which operates, or initiates the operation of, the device concerned |
| 19/04 | • by indicating members moved electrically, e.g. flap, band | 23/12 | • . . Electric circuitry |
| 21/00 | Producing acoustic time signals by electrical means {(for mechanical clocks or watches G04B 21/08 , G04B 25/00)} | 23/14 | • Mechanisms continuously running to relate the operation(s) to the time of day |
| 21/02 | • Constructional details (G04C 21/04 , G04C 21/16 take precedence {sound producing devices in general G10K , e.g. G10K 1/00 }) | 23/16 | • . . acting only at one preselected time or during one adjustable time interval |
| 21/04 | • Indicating the time of the day (acoustic indication of time G04B 21/00) | 23/18 | • . . for operating one device at a number of different times |
| 21/06 | • . . by striking mechanism | 23/20 | • . . . with contacts operated, or formed by clock hands or elements of similar form |
| 21/08 | • . . . with snail | 23/22 | • . . . with the actuating element carried by a disc |
| 21/10 | • . . . with locking plate | 23/24 | • . . . the actuating element controlling another element mechanically |
| 21/12 | • . . by electro-acoustic means | 23/26 | • . . for operating a number of devices at different times |
| 21/14 | • . . Electro-acoustic time announcement, i.e. spoken | 23/28 | • . . . with contacts operated, or formed, by clock hands or elements of similar form |
| 21/16 | • producing the signals at adjustable fixed times | 23/30 | • . . . with the actuating element carried by a disc |
| 21/18 | • . . by mechanically unlocking an electromechanical vibrator, e.g. actuated by the leakage flux of the electric driving means | 23/32 | • . . . the actuating element controlling another element mechanically |
| 21/185 | • . . . {provided with means for sheeting off or temporarily stopping the signal} | 23/34 | • . . with provision for automatic modification of the programme, e.g. on Sunday |
| 21/20 | • . . by closing a contact to ring an electromechanical alarm | 23/342 | • . . . {some operations being performed at another time} |
| 21/205 | • . . . {by the hand(s) or handlike members closing the contact} | 23/345 | • . . . {another programme being carried out} |
| 21/22 | • . . . put into action by the arbor of a mechanical alarm work | 23/347 | • . . . {some operations being overridden} |
| 21/24 | • . . . put into action by the spring of a mechanical alarm work | 23/36 | • . . . by external influences |
| 21/26 | • . . . put into action by the vibrations caused by the operation of a mechanical alarm work | 23/38 | • Mechanisms measuring a chosen time interval independently of the time of day at which interval starts |
| 21/28 | • . . by closing a contact to put into action electro-acoustic means, e.g. awakening by music | 23/40 | • . . using continuously-running mechanism |
| 21/30 | • . . with provision for a number of operations at different times, e.g. ringing the bells in a school | 23/42 | • . . acting only at the end of a single time interval |
| 21/305 | • . . . {by the hand(s) or handlike members closing the contacts} | 23/44 | • . . . with provision for selection from a number of preset intervals |
| 21/32 | • . . . giving indications at a number of places each at a different time, e.g. system of alarms in a hotel | 23/46 | • . . . with provision for adjustment of the interval (G04C 23/44 takes precedence) |
| 21/323 | • {by the hand(s) or handlike members closing the contacts} | 23/48 | • . . acting at the ends of successive time intervals |
| 21/326 | • {adjustable from the different places themselves} | 23/50 | • . . with provision for modification of the interval(s) by external influences |
| 21/34 | • . . Devices on watches or similar portable timepieces | | |
| 21/36 | • . . Signal repeating devices | | |
| 21/38 | • . . Adjusting the duration of signals | | |
| 23/00 | 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 G04C 21/00 ; mechanical alarm clocks G04B 23/02 ; apparatus which can be set and started to measure-off predetermined intervals G04F 3/06 ; time or time-programme switches which automatically terminate their operation after the programme is completed H01H 43/00) | | |
| 23/02 | • Constructional details | | |
| 23/04 | • . . Housings, supports, shielding, or similar stationary parts | | |
| 23/06 | • . . Driving or regulating means | | |
| 23/08 | • . . Programming means | | |
| | | 99/00 | Subject matter not provided for in other groups of this subclass |