

## SECTION G — PHYSICS

### 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(s)

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.

#### Subclass index

ELECTRIC WINDING OF MECHANICAL CLOCKS.....	1/00
ELECTROMECHANICAL CLOCK MOVEMENTS; ELECTRIC OR MAGNETIC ESCAPEMENTS.....	3/00, 5/00
TIME INDICATING	
Optical; acoustical means.....	17/00, 19/00, 21/00
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SYNCHRONISATION; MASTER-AND-SLAVE CLOCK SYSTEM; SYNCHRONOUS-MOTOR CLOCKS.....	11/00, 13/00, 15/00
CLOCKS FOR OPERATING A DEVICE AT A PRESELECTED TIME.....	23/00
SUBJECT MATTER NOT PROVIDED FOR IN OTHER GROUPS OF THIS SUBCLASS.....	99/00

#### Electric winding of mechanical clocks; Independent electric clocks or watches

- 1/00 Winding mechanical clocks electrically** (winding mechanically G04B 3/00) [1, 2006.01]
- 1/02 • by electromagnets [1, 2006.01]
- 1/04 • by electric motors with rotating or with reciprocating movement [1, 2006.01]
- 1/06 • • winding-up springs [1, 2006.01]
- 1/08 • • raising weights [1, 2006.01]
- 1/10 • Protection against overwinding (in mechanical clocks or watches G04B 1/20, G04B 3/06, G04B 3/10) [1, 2006.01]
- 1/12 • • of the spring [1, 2006.01]
- 1/14 • • of the weights [1, 2006.01]
- 3/00 Electromechanical clocks or watches independent of other time-pieces and in which the movement is maintained by electric means** (clocks driven by synchronous motors G04C 15/00) [1, 2006.01]
- 3/02 • wherein movement is regulated by a pendulum [1, 2006.01]
- 3/027 • • using electromagnetic coupling between electric power source and pendulum (G04C 3/033 takes precedence) [3, 2006.01]
- 3/033 • • using torsion pendulums; using conical pendulums (construction thereof G04B 17/00) [3, 2006.01]
- 3/04 • wherein movement is regulated by a balance [1, 2006.01]
- 3/06 • • using electromagnetic coupling between electric power source and balance [3, 2006.01]

- 3/08 • wherein movement is regulated by a mechanical oscillator other than a pendulum or balance, e.g. by a tuning fork [3, 2006.01]
- 3/10 • • driven by electromagnetic means [3, 2006.01]
- 3/12 • • driven by piezo-electric means; driven by magneto-strictive means [3, 2006.01]
- 3/14 • incorporating a stepping motor (G04C 3/02-G04C 3/12 take precedence) [3, 2006.01]
- 3/16 • incorporating an electro-dynamic continuously rotating motor (G04C 3/02-G04C 3/12 take precedence) [3, 2006.01]
- 3/18 • incorporating electro-thermal or electro-pneumatic driving means [3, 2006.01]
- 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) [1, 3, 2006.01]
- 9/00 Electrically-actuated devices for setting the time-indicating means** (of slave clocks G04C 13/03; radio-controlled time-pieces G04R) [1, 3, 2006.01]
- 9/04 • by blocking the driving means [3, 2006.01]
- 9/06 • by decoupling the driving means (combined with blocking means G04C 9/04) [3, 2006.01]
- 9/08 • by electric drive [3, 2006.01]
- 10/00 Arrangements of electric power supplies in time-pieces** [3, 2006.01]
- 10/02 • the power supply being a radioactive source [3, 2006.01]
- 10/04 • with means for indicating the condition of the power supply [3, 2006.01]



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

- 11/00 Synchronisation of independently-driven clocks** (radio-controlled time-pieces G04R) [1, 2006.01]
- 11/04 • over a line (transmitting time signals over telephone networks H04M 11/06) [1, 2006.01]
- 11/06 • with direct mechanical action on the time-indicating means [3, 2006.01]
- 11/08 • using an electric magnet or motor [3, 2006.01]
- 13/00 Driving mechanisms for clocks by master clocks** [1, 2006.01]
- 13/02 • Circuit arrangements; Electric clock installations [1, 2006.01]
- 13/03 • • Pulse transmission systems with additional means for setting the time indication of slave clocks [3, 2006.01]
- 13/04 • • Master clocks [1, 2006.01]
- 13/06 • • • Contact devices (for simultaneously winding several clocks G04C 1/00) [1, 2006.01]
- 13/08 • Slave clocks actuated intermittently [1, 2006.01]
- 13/10 • • by electromechanical step-advancing mechanisms [1, 2006.01]
- 13/11 • • • with rotating armature [3, 2006.01]
- 13/12 • • by continuously-rotating electric motors [1, 3, 2006.01]
- 13/14 • • by electrically-released mechanical driving mechanisms [1, 2006.01]
- 15/00 Clocks driven by synchronous motors** [1, 2006.01]

**Indicating the time or producing time signals electrically**

- 17/00 Indicating the time optically by electric means** (G04C 19/00 takes precedence; liquid crystal materials C09K 19/00; by mechanical means G04B 19/00, G04B 19/20) [1, 3, 2006.01]
- 17/02 • by electric lamps [1, 2006.01]
- 19/00 Producing optical time signals at prefixed times by electric means** [1, 2006.01]
- 19/02 • by electric lamps [1, 2006.01]
- 19/04 • by indicating members moved electrically, e.g. flap, band [1, 2006.01]
- 21/00 Producing acoustic time signals by electrical means** [1, 2006.01]
- 21/02 • Constructional details (G04C 21/04, G04C 21/16 take precedence) [1, 2006.01]
- 21/04 • Indicating the time of the day (acoustic indication of time G04B 21/00) [1, 2006.01]
- 21/06 • • by striking mechanism [1, 2006.01]
- 21/08 • • • with snail [1, 2006.01]
- 21/10 • • • with locking plate [1, 2006.01]
- 21/12 • • by electro-acoustic means [1, 2006.01]
- 21/14 • • • Electro-acoustic time announcement, i.e. spoken [1, 2006.01]
- 21/16 • producing the signals at adjustable fixed times [1, 2006.01]
- 21/18 • • by mechanically unlocking an electromechanical vibrator, e.g. actuated by the leakage flux of the electric driving means [1, 2006.01]
- 21/20 • • by closing a contact to ring an electromechanical alarm [1, 2006.01]
- 21/22 • • • put into action by the arbor of a mechanical alarm work [1, 2006.01]

- 21/24 • • • put into action by the spring of a mechanical alarm work [1, 2006.01]
- 21/26 • • • put into action by the vibrations caused by the operation of a mechanical alarm work [1, 2006.01]
- 21/28 • • by closing a contact to put into action electro-acoustic means, e.g. awakening by music [1, 2006.01]
- 21/30 • • with provision for a number of operations at different times, e.g. ringing the bells in a school [1, 2006.01]
- 21/32 • • • giving indications at a number of places, each at a different time, e.g. system of alarms in a hotel [1, 2006.01]
- 21/34 • • Devices on watches or similar portable time-pieces [1, 2006.01]
- 21/36 • • Signal-repeating devices [1, 2006.01]
- 21/38 • • Adjusting the duration of signals [1, 2006.01]
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- 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) [1, 2006.01]
- 23/02 • Constructional details [1, 2006.01]
- 23/04 • • Housings, supports, shielding, or similar stationary parts [1, 2006.01]
- 23/06 • • Driving or regulating means [1, 2006.01]
- 23/08 • • Programming means [1, 2006.01]
- 23/10 • • for actuating any element which operates, or initiates the operation of, the device concerned [1, 2006.01]
- 23/12 • • Electric circuitry [1, 2006.01]
- 23/14 • Mechanisms continuously running to relate the operation(s) to the time of day [1, 2006.01]
- 23/16 • • acting only at one preselected time or during one adjustable time interval [1, 2006.01]
- 23/18 • • for operating one device at a number of different times [1, 2006.01]
- 23/20 • • • with contacts operated, or formed, by clock hands or elements of similar form [1, 2006.01]
- 23/22 • • • with the actuating element carried by a disc [1, 2006.01]
- 23/24 • • • the actuating element controlling another element mechanically [1, 2006.01]
- 23/26 • • for operating a number of devices at different times [1, 2006.01]
- 23/28 • • • with contacts operated, or formed, by clock hands or elements of similar form [1, 2006.01]
- 23/30 • • • with the actuating element carried by a disc [1, 2006.01]
- 23/32 • • • the actuating element controlling another element mechanically [1, 2006.01]
- 23/34 • • with provision for automatic modification of the programme, e.g. on Sunday [1, 2006.01]
- 23/36 • • • by external influences [1, 2006.01]
- 23/38 • Mechanisms measuring a chosen time interval independently of the time of day at which the interval starts [1, 2006.01]
- 23/40 • • using continuously-running mechanism [1, 2006.01]



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| <p>23/42    • • acting only at the end of a single time interval <b>[1, 2006.01]</b></p> <p>23/44    • • • with provision for selection from a number of preset intervals <b>[1, 2006.01]</b></p> <p>23/46    • • • with provision for adjustment of the interval (G04C 23/44 takes precedence) <b>[1, 2006.01]</b></p> | <p>23/48    • • acting at the ends of successive time intervals <b>[1, 2006.01]</b></p> <p>23/50    • • with provision for modification of the interval(s) by external influences <b>[1, 2006.01]</b></p> <p><b>99/00    Subject matter not provided for in other groups of this subclass [2006.01]</b></p> |
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