

## 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
TIME SETTING.....	9/00
POWER SUPPLIES.....	10/00
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

- |  |  |
|--|--|
| <p><b>1/00 Winding mechanical clocks electrically</b> (winding mechanically G04B 3/00)</p> <p>1/02 • by electromagnets</p> <p>1/04 • by electric motors with rotating or with reciprocating movement</p> <p>1/06 • • winding-up springs</p> <p>1/08 • • raising weights</p> <p>1/10 • Protection against overwinding (in mechanical clocks or watches G04B 1/20, G04B 3/06, G04B 3/10)</p> <p>1/12 • • of the spring</p> <p>1/14 • • of the weights</p> <p><b>3/00 Electromechanical clocks or watches independent of other time-pieces and in which the movement is maintained by electric means</b> (clocks driven by synchronous motors G04C 15/00)</p> <p>3/02 • wherein movement is regulated by a pendulum</p> <p>3/027 • • using electromagnetic coupling between electric power source and pendulum (G04C 3/033 takes precedence) [3]</p> <p>3/033 • • using torsion pendulums; using conical pendulums (construction thereof G04B 17/00) [3]</p> <p>3/04 • wherein movement is regulated by a balance</p> <p>3/06 • • using electromagnetic coupling between electric power source and balance [3]</p> <p>3/08 • wherein movement is regulated by a mechanical oscillator other than a pendulum or balance, e.g. by a tuning fork [3]</p> <p>3/10 • • driven by electromagnetic means [3]</p> | <p>3/12 • • driven by piezo-electric means; driven by magneto-strictive means [3]</p> <p>3/14 • incorporating a stepping motor (G04C 3/02-G04C 3/12 take precedence) [3]</p> <p>3/16 • incorporating an electro-dynamic continuously rotating motor (G04C 3/02-G04C 3/12 take precedence) [3]</p> <p>3/18 • incorporating electro-thermal or electro-pneumatic driving means [3]</p> <p><b>5/00 Electric or magnetic means for converting oscillatory to rotary motion in time-pieces, i.e. electric or magnetic escapements</b> (regulators G04C 3/00) [3]</p> <p><b>9/00 Electrically-actuated devices for setting the time-indicating means</b> (of slave clocks G04C 13/03; mechanical setting devices G04B 27/00) [3]</p> <p>9/02 • brought into action by radio transmission</p> <p>9/04 • by blocking the driving means [3]</p> <p>9/06 • by decoupling the driving means (combined with blocking means G04C 9/04) [3]</p> <p>9/08 • by electric drive [3]</p> <p><b>10/00 Arrangements of electric power supplies in time-pieces</b> [3]</p> <p>10/02 • the power supply being a radioactive source [3]</p> <p>10/04 • with means for indicating the condition of the power supply [3]</p> |
|--|--|

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

- 11/00 Synchronisation of independently-driven clocks**
- 11/02 • by radio
- 11/04 • over a line (transmitting time signals over telephone networks H04M 11/06)
- 11/06 • with direct mechanical action on the time-indicating means [3]
- 11/08 • using an electric magnet or motor [3]
- 13/00 Driving mechanisms for clocks by master clocks**
- 13/02 • Circuit arrangements; Electric clock installations
- 13/03 • • Pulse transmission systems with additional means for setting the time indication of slave clocks [3]
- 13/04 • • Master clocks
- 13/06 • • • Contact devices (for simultaneously winding several clocks G04C 1/00)
- 13/08 • Slave clocks actuated intermittently
- 13/10 • • by electromechanical step-advancing mechanisms
- 13/11 • • • with rotating armature [3]
- 13/12 • • by continuously-rotating electric motors [3]
- 13/14 • • by electrically-released mechanical driving mechanisms
- 15/00 Clocks driven by synchronous motors**
- 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) [3]
- 17/02 • by electric lamps
- 19/00 Producing optical time signals at prefixed times by electric means**
- 19/02 • by electric lamps
- 19/04 • by indicating members moved electrically, e.g. flap, band
- 21/00 Producing acoustic time signals by electrical means**
- 21/02 • Constructional details (G04C 21/04, G04C 21/16 take precedence)
- 21/04 • Indicating the time of the day (acoustic indication of time G04B 21/00)
- 21/06 • • by striking mechanism
- 21/08 • • • with snail
- 21/10 • • • with locking plate
- 21/12 • • by electro-acoustic means
- 21/14 • • • Electro-acoustic time announcement, i.e. spoken
- 21/16 • producing the signals at adjustable fixed times
- 21/18 • • by mechanically unlocking an electromechanical vibrator, e.g. actuated by the leakage flux of the electric driving means
- 21/20 • • by closing a contact to ring an electromechanical alarm
- 21/22 • • • put into action by the arbor of a mechanical alarm work
- 21/24 • • • put into action by the spring of a mechanical alarm work
- 21/26 • • • put into action by the vibrations caused by the operation of a mechanical alarm work
- 21/28 • • by closing a contact to put into action electro-acoustic means, e.g. awakening by music

- 21/30 • • with provision for a number of operations at different times, e.g. ringing the bells in a school
- 21/32 • • • giving indications at a number of places, each at a different time, e.g. system of alarms in a hotel
- 21/34 • • Devices on watches or similar portable time-pieces
- 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
- 23/10 • • for actuating any element which operates, or initiates the operation of, the device concerned
- 23/12 • • Electric circuitry
- 23/14 • Mechanisms continuously running to relate the operation(s) to the time of day
- 23/16 • • acting only at one preselected time or during one adjustable time interval
- 23/18 • • for operating one device at a number of different times
- 23/20 • • • with contacts operated, or formed, by clock hands or elements of similar form
- 23/22 • • • with the actuating element carried by a disc
- 23/24 • • • • the actuating element controlling another element mechanically
- 23/26 • • for operating a number of devices at different times
- 23/28 • • • with contacts operated, or formed, by clock hands or elements of similar form
- 23/30 • • • with the actuating element carried by a disc
- 23/32 • • • • the actuating element controlling another element mechanically
- 23/34 • • with provision for automatic modification of the programme, e.g. on Sunday
- 23/36 • • • by external influences
- 23/38 • Mechanisms measuring a chosen time interval independently of the time of day at which the interval starts
- 23/40 • • using continuously-running mechanism
- 23/42 • • acting only at the end of a single time interval
- 23/44 • • • with provision for selection from a number of preset intervals
- 23/46 • • • with provision for adjustment of the interval (G04C 23/44 takes precedence)
- 23/48 • • acting at the ends of successive time intervals
- 23/50 • • with provision for modification of the interval(s) by external influences
- 99/00 Subject matter not provided for in other groups of this subclass [2006.01]**