

SECTION G — PHYSICS

G04 HOROLOGY

G04B MECHANICALLY-DRIVEN CLOCKS OR WATCHES; MECHANICAL PARTS OF CLOCKS OR WATCHES IN GENERAL; TIME-PIECES USING THE POSITION OF THE SUN, MOON, OR STARS (spring- or weight-driven mechanisms in general F03G; electromechanical clocks or watches G04C; electromechanical clocks with attached or built-in means operating any device at preselected times or after predetermined time intervals G04C 23/00; clocks or watches with stop devices G04F 7/08; structural details or housings specially adapted for electronic time-pieces with no moving parts G04G 17/00)

Note(s)

This subclass covers mechanically-driven calendar clocks or clockwork calendars, and the mechanical part of such clocks or calendars.

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Driving mechanisms

1/00	Driving mechanisms
1/02	• with driving weight
1/04	• • Mechanisms in which the clockwork acts as the driving weight
1/06	• • with several weights
1/08	• • Driving weights; Chains; Chain wheels; Arbors for chain wheels
1/10	• with mainspring
1/12	• • with several mainsprings
1/14	• • Mainsprings; Bridles therefor (mainsprings with bridles G04B 1/18; alloys C22C; springs in general F16F)
1/16	• • Barrels; Arbors; Barrel axles (arrangements facilitating the removal of the mainspring G04B 33/14)
1/18	• • Constructions for connecting the ends of mainsprings with the barrel or the arbor
1/20	• • • Protecting arrangements against rupture or overwinding of the mainspring located in the barrel or attached to the barrel (in connection with keys or the like G04B 3/06, G04B 3/10; in connection with automatic winding devices G04B 5/24)

- 1/22 • • Compensation of changes in the motive power of the mainspring (by mechanical shaping of the mainspring G04B 1/14)
- 1/24 • with both mainsprings and driving weights
- 1/26 • driven by liquids or gases; Liquid or gaseous drives for mechanically-controlled secondary clocks

Winding

- 3/00 Normal winding of clockworks by hand or mechanically; Winding-up several mainsprings or driving weights simultaneously**
- 3/02 • Removably-mounted keys or the like
- 3/04 • Rigidly-mounted keys, knobs, or crowns (divided winding stems G04B 37/06)
- 3/06 • Keys or the like with means preventing overwinding (protecting devices arranged in, or attached to, the barrel G04B 1/20; in connection with automatic winding devices G04B 5/24)
- 3/08 • by parts of the cases
- 3/10 • • Protecting means preventing overwinding (arranged in, or attached to, the barrel G04B 1/20; in connection with keys G04B 3/06; in connection with automatic winding devices G04B 5/24)
- 3/12 • by mechanical means, e.g. pneumatic motor (winding-up with electric or electromechanical means G04C)

5/00 Automatic winding-up

- 5/02 • by self-winding caused by movement of the watch
- 5/04 • • by oscillating weights the movement of which is limited
- 5/06 • • • acting in one direction only
- 5/08 • • • acting in both directions
- 5/10 • • by oscillating weights the movement of which is not limited
- 5/12 • • • acting in one direction only
- 5/14 • • • acting in both directions
- 5/16 • • Construction of the weights
- 5/18 • • Supports, suspensions, or guide arrangements, for oscillating weights
- 5/19 • • • Suspension of the oscillating weight at its centre of rotation [3]
- 5/20 • by movements of other objects, e.g. by opening hand-bag, by opening case, by opening door; Winding-up by wind power
- 5/22 • by thermometric, barometric, or like effects or alterations
- 5/24 • Protecting means preventing overwinding (arranged in, or attached to, the barrel G04B 1/20; in connection with keys or the like G04B 3/06; in connection with parts of the cases G04B 3/10)

7/00 Combined normal and automatic winding-up**9/00 Supervision of the state of winding, e.g. indicating the amount of winding**

- 9/02 • Devices controlled by such state, e.g. device affording protection against overwinding (protecting means preventing overwinding arranged in or on the barrel G04B 1/20; protecting means in connection with keys or the like G04B 3/06; in connection with parts of the cases G04B 3/10; in connection with automatic winding devices G04B 5/24)

11/00 Click devices, stop clicks or clutches for winding

- 11/02 • Devices allowing the motion of a rotatable part in only one direction [3]
- 11/04 • • Pawl constructions therefor, e.g. pawl secured to an oscillating member actuating a ratchet [3]

13/00 Gearwork

- 13/02 • Wheels; Pinions; Spindles; Pivots (bearings G04B 31/00)

15/00 Escapements (electric or magnetic means for converting oscillatory to rotary motion in electromechanical time-pieces G04C 5/00)

- 15/02 • permanently in contact with the regulating mechanism
- 15/04 • • Cylinder escapements
- 15/06 • Free escapements
- 15/08 • • Lever escapements
- 15/10 • with constant impulses for the regulating mechanism
- 15/12 • Adjusting (tools therefor G04D 1/02); Restricting the amplitude of the lever or the like
- 15/14 • Component parts or constructional details, e.g. construction of the lever or the escape wheel

17/00 Mechanisms for stabilising frequency [3]

- 17/02 • Oscillators acting by gravity, e.g. pendulum swinging in a plane
- 17/04 • Oscillators acting by spring tension
- 17/06 • • Oscillators with hairsprings, e.g. balance

- 17/08 • • Oscillators with coil springs stretched and unstretched axially
- 17/10 • • Oscillators with torsion strips or with springs acting in the same manner as torsion strips, e.g. weight oscillating in a horizontal plane
- 17/20 • Compensation of mechanisms for stabilizing frequency
- 17/22 • • for the effect of variations of temperature (alloys independent of variations of temperature C22C)
- 17/24 • • for the effect of variations of atmospheric pressure
- 17/26 • • for the effect of variations of the impulses
- 17/28 • • for the effect of unbalance of the weights, e.g. tourbillon
- 17/30 • Rotating governors, e.g. centrifugal governors, fan governors (for striking mechanism G04B 21/06)
- 17/32 • Component parts or constructional details, e.g. collet, stud
- 17/34 • • for fastening the hairspring onto the balance [3]
- 18/00 Mechanisms for setting frequency [3]**
- 18/02 • Regulator devices; Indexing devices [3]
- 18/04 • Adjusting the beat of the pendulum, balance, or the like, e.g. putting into beat [3]
- 18/06 • • by setting the collet or the stud of a hairspring [3]
- 18/08 • Component parts or constructional details [3]

Time indicating**19/00 Indicating the time by visual means** (by electric lamps G04C 17/02; display arrangements in general G09)

- 19/02 • Back-gearing arrangements between gear train and hands
- 19/04 • Hands; Discs with a single mark or the like
- 19/06 • Dials (for time-pieces without clockwork G04B 49/04)
- 19/08 • • Geometrical arrangement of the graduations
- 19/10 • • Ornamental shape of the graduations or the surface of the dial; Attachment of graduations to the dial
- 19/12 • • Selection of materials for dials or graduations
- 19/14 • • Fastening the dials to the clock or the watch plates
- 19/16 • • Shiftable dials, e.g. indicating alternately from 1 to 12 and from 13 to 24
- 19/18 • • Graduations on the crystal or glass, on the bezel, or on the rim
- 19/20 • Indicating by numbered bands, drums, discs, or sheets
- 19/21 • • Drums [3]
- 19/22 • Arrangements for indicating different local apparent times; Universal time-pieces
- 19/23 • • by means of additional hands or additional pairs of hands [3]
- 19/24 • Clocks or watches with date indicators; Clockwork calendars
- 19/243 • • characterised by the shape of the date indicator [3]
- 19/247 • • • disc-shaped [3]
- 19/25 • • • Devices for setting the date indicators manually [3]
- 19/253 • • • Driving or releasing mechanisms [3]
- 19/257 • • • drum-shaped [3]
- 19/26 • Clocks or watches with indicators for tides, for the phases of the moon, or the like
- 19/28 • Adjustable guide marks or pointers for indicating determined points of time
- 19/30 • Illumination of dials or hands
- 19/32 • • by luminescent substances

- 19/34 • Position of the hands projected optically
- 21/00 Indicating the time by acoustic means** (at preselected times G04B 23/00; by electro-acoustic means G04C 21/04; sound-producing apparatus *per se* G10)
- 21/02 • Regular striking mechanisms giving the full hour, half hour, or quarter hour
- 21/04 • • Hour wheels; Racks or rakes; Snails or similar control mechanisms
- 21/06 • • Details of striking mechanisms, e.g. hammer, fan governor
- 21/08 • • Sounding bodies; Whistles; Musical apparatus (with electro-acoustic transmitters G04C 21/00)
- 21/10 • • Releasing or locking the regular stroke, e.g. for silence during the night
- 21/12 • • Reiterating watches or clocks
- 21/14 • • Winding-up the striking mechanism by the clockwork; Winding-up the clockwork by the striking mechanism
- 23/00 Arrangements producing acoustic signals at preselected times** (electrically-released alarm signals G04C 21/00; metronomes G04F 5/02; sound-producing apparatus *per se* G10)
- 23/02 • Alarm clocks
- 23/03 • • Alarm signal stop arrangements [3]
- 23/04 • • with coarse and fine setting of the preselected time
- 23/06 • • adjustable for several preselected times with automatic stopping of the signal
- 23/08 • • operating on successive days without resetting; operating only once in each 24 hours
- 23/10 • • with presignal; with repeated signal; with changeable intensity of sound
- 23/12 • • Alarm watches to be worn in pockets or on the wrist (giving signals by stimulating the skin G04B 25/04)
- 25/00 Indicating the time by other means or by combined means** (electric or electromechanical indicating G04C)
- 25/02 • by feeling; Clocks or watches for blind persons
- 25/04 • • Alarm clocks or watches with devices stimulating the skin
- 25/06 • by moving figures, e.g. cuckoo-clock, trumpet clock
- 27/00 Mechanical devices for setting the time-indicating means**
- 27/02 • by making use of the winding means
- 27/04 • • with clutch wheel
- 27/06 • • with rocking bar
- 27/08 • by using parts of the case

Frameworks, supports, or arrangements of the clockwork parts in relation to each other, so-called "calibers"

- 29/00 Frameworks**
- 29/02 • Plates; Bridges; Cocks
- 29/04 • Connecting or supporting parts
- 31/00 Bearings; Point suspensions or counter-point suspensions; Pivot bearings; Single parts therefor** (bearings in general F16C)
- 31/004 • characterised by the material used [3]
- 31/008 • • Jewel bearings (G04B 31/04 takes precedence) [3]
- 31/012 • • Metallic bearings [3]
- 31/016 • • Plastic bearings [3]
- 31/02 • Shock-damping bearings
- 31/04 • • with jewel hole and cap jewel [3]

- 31/06 • Manufacture or mounting processes [3]
- 31/08 • Lubrication [3]
- 33/00 Calibers**
- 33/02 • Circular calibers
- 33/04 • Non-circular calibers
- 33/06 • of extremely flat shape
- 33/08 • in which the gear train is arranged in different planes, e.g. parallel or inclined to each other (G04B 33/10 takes precedence)
- 33/10 • with seconds hand arranged in the centre of the dial
- 33/12 • for extremely-long running times
- 33/14 • Calibers of which the mainsprings or barrels are easily removable (mainsprings G04B 1/14; barrels, arbors G04B 1/16)
- 33/16 • with arrangements affording protection of the clockwork against damage as a consequence of a rupture of the mainspring
- 35/00 Adjusting the gear train, e.g. the backlash of the arbors, depth of meshing of the gears**

Protection of the clockwork against damage from outside

- 37/00 Cases**
- 37/02 • Evacuated cases; Cases filled with gases or liquids; Cases containing substances for absorbing or binding moisture or dust
- 37/04 • Mounting the clockwork in the case; Shock-absorbing mountings
- 37/05 • • Fixed mountings for pocket or wrist watches [3]
- 37/06 • Forming the passage for the winding stem through the case; Divided winding stems
- 37/08 • Hermetic sealing of openings, joints, passages, or slits
- 37/10 • • of winding stems
- 37/11 • • of the back cover of pocket or wrist watches [3]
- 37/12 • Cases for special purposes, e.g. watch combined with ring, watch combined with button (watch guards or protectors A45C 11/10, A45C 11/12; watches combined with cosmetic powder containers A45D 33/30)
- 37/14 • Suspending devices, supports, or stands for time-pieces in so far as they form part of the case (wrist-watch straps, fastening means therefor A44C 5/00)
- 37/16 • • Fastening the case to the bracelet [3]
- 37/18 • for pocket or wrist watches (G04B 37/02-G04B 37/16 takes precedence) [3]
- 37/20 • • with hinged covers or backs [3]
- 37/22 • Materials or processes of manufacturing pocket watch or wrist watch cases [3]
- 39/00 Watch crystals; Fastening or sealing crystals; Clock glasses**
- 39/02 • Sealing crystals or glasses [3]
- 41/00 Locking or holding devices for pendulums, chimes, or the like, for use during transport**
- 43/00 Protecting clockworks by shields or other means against external influences, e.g. magnetic fields**
- Clocks with unusual features**
- 45/00 Time-pieces of which the indicating means or cases provoke special effects, e.g. aesthetic effect** (ornamental shaping of dials G04B 19/10)

G04B

- 45/02 • Time-pieces of which the clockwork is visible partly or wholly
- 45/04 • Time-pieces with invisible drive, e.g. with hands attached to rotating glass disc
- 47/00 **Time-pieces combined with other articles which do not interfere with the running or the time-keeping of the time-piece** (G04B 37/12 takes precedence; writing or drawing implements with devices for indicating time B43K 29/087; combinations with vehicle mirror assemblies B60R 1/12; combined with cameras, projectors, or photographic printing apparatus G03B 29/00)
- 47/02 • Installations within mirrors, pictures, furniture, or other household articles

- 47/04 • with attached ornaments or amusement apparatus
 - 47/06 • with attached measuring instruments, e.g. pedometer, barometer, thermometer, compass
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- 49/00 **Time-pieces using the position of the sun, moon, or stars**
- 49/02 • Sundials
- 49/04 • • Graduation or shaping of dials
- 99/00 **Subject matter not provided for in other groups of this subclass [2006.01]**