

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, 2006.01]
1/02	• with driving weight [1, 2006.01]
1/04	• • Mechanisms in which the clockwork acts as the driving weight [1, 2006.01]
1/06	• • with several weights [1, 2006.01]
1/08	• • Driving weights; Chains; Chain wheels; Arbors for chain wheels [1, 2006.01]
1/10	• with mainspring [1, 2006.01]
1/12	• • with several mainsprings [1, 2006.01]
1/14	• • Mainsprings; Bridles therefor (mainsprings with bridles G04B 1/18; alloys C22C; springs in general F16F) [1, 2006.01]
1/16	• • Barrels; Arbors; Barrel axles (arrangements facilitating the removal of the mainspring G04B 33/14) [1, 2006.01]
1/18	• • Constructions for connecting the ends of mainsprings with the barrel or the arbor [1, 2006.01]
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, 2006.01]

- 1/22 • • Compensation of changes in the motive power of the mainspring (by mechanical shaping of the mainspring G04B 1/14) [1, 2006.01]
- 1/24 • with both mainsprings and driving weights [1, 2006.01]
- 1/26 • driven by liquids or gases; Liquid or gaseous drives for mechanically-controlled secondary clocks [1, 2006.01]

Winding

- 3/00** **Normal winding of clockworks by hand or mechanically; Winding-up several mainsprings or driving weights simultaneously [1, 2006.01]**
- 3/02 • Removably-mounted keys or the like [1, 2006.01]
- 3/04 • Rigidly-mounted keys, knobs, or crowns (divided winding stems G04B 37/06) [1, 2006.01]
- 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) [1, 2006.01]
- 3/08 • by parts of the cases [1, 2006.01]
- 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) [1, 2006.01]

3/12	• by mechanical means, e.g. pneumatic motor (winding-up with electric or electromechanical means G04C) [1, 2006.01]	15/12	• Adjusting (tools therefor G04D 1/02); Restricting the amplitude of the lever or the like [1, 2006.01]
5/00	Automatic winding-up [1, 2006.01]	15/14	• Component parts or constructional details, e.g. construction of the lever or the escape wheel [1, 2006.01]
5/02	• by self-winding caused by movement of the watch [1, 2006.01]	17/00	Mechanisms for stabilising frequency [1, 3, 2006.01]
5/04	• • by oscillating weights the movement of which is limited [1, 2006.01]	17/02	• Oscillators acting by gravity, e.g. pendulum swinging in a plane [1, 2006.01]
5/06	• • • acting in one direction only [1, 2006.01]	17/04	• Oscillators acting by spring tension [1, 2006.01]
5/08	• • • acting in both directions [1, 2006.01]	17/06	• • Oscillators with hairsprings, e.g. balance [1, 2006.01]
5/10	• • by oscillating weights the movement of which is not limited [1, 2006.01]	17/08	• • Oscillators with coil springs stretched and unstretched axially [1, 2006.01]
5/12	• • • acting in one direction only [1, 2006.01]	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 [1, 2006.01]
5/14	• • • acting in both directions [1, 2006.01]	17/20	• Compensation of mechanisms for stabilizing frequency [1, 2006.01]
5/16	• • Construction of the weights [1, 2006.01]	17/22	• • for the effect of variations of temperature (alloys independent of variations of temperature C22C) [1, 2006.01]
5/18	• • Supports, suspensions, or guide arrangements, for oscillating weights [1, 2006.01]	17/24	• • for the effect of variations of atmospheric pressure [1, 2006.01]
5/19	• • • Suspension of the oscillating weight at its centre of rotation [3, 2006.01]	17/26	• • for the effect of variations of the impulses [1, 2006.01]
5/20	• by movements of other objects, e.g. by opening hand-bag, by opening case, by opening door; Winding-up by wind power [1, 2006.01]	17/28	• • for the effect of unbalance of the weights, e.g. tourbillon [1, 2006.01]
5/22	• by thermometric, barometric, or like effects or alterations [1, 2006.01]	17/30	• Rotating governors, e.g. centrifugal governors, fan governors (for striking mechanism G04B 21/06) [1, 2006.01]
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) [1, 2006.01]	17/32	• Component parts or constructional details, e.g. collet, stud [1, 2006.01]
7/00	Combined normal and automatic winding-up [1, 2006.01]	17/34	• • for fastening the hairspring onto the balance [3, 2006.01]
9/00	Supervision of the state of winding, e.g. indicating the amount of winding [1, 2006.01]	18/00	Mechanisms for setting frequency [3, 2006.01]
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) [1, 2006.01]	18/02	• Regulator devices; Indexing devices [3, 2006.01]
11/00	Click devices, stop clicks or clutches for winding [1, 2006.01]	18/04	• Adjusting the beat of the pendulum, balance, or the like, e.g. putting into beat [3, 2006.01]
11/02	• Devices allowing the motion of a rotatable part in only one direction [3, 2006.01]	18/06	• • by setting the collet or the stud of a hairspring [3, 2006.01]
11/04	• • Pawl constructions therefor, e.g. pawl secured to an oscillating member actuating a ratchet [3, 2006.01]	18/08	• Component parts or constructional details [3, 2006.01]
<hr/>		<u>Time indicating</u>	
13/00	Gearwork [1, 2006.01]	19/00	Indicating the time by visual means (by electric lamps G04C 17/02; display arrangements in general G09) [1, 2006.01]
13/02	• Wheels; Pinions; Spindles; Pivots (bearings G04B 31/00) [1, 2006.01]	19/02	• Back-gearing arrangements between gear train and hands [1, 2006.01]
15/00	Escapements (electric or magnetic means for converting oscillatory to rotary motion in electromechanical time-pieces G04C 5/00) [1, 2006.01]	19/04	• Hands; Discs with a single mark or the like [1, 2006.01]
15/02	• permanently in contact with the regulating mechanism [1, 2006.01]	19/06	• Dials (for time-pieces without clockwork G04B 49/04) [1, 2006.01]
15/04	• • Cylinder escapements [1, 2006.01]	19/08	• • Geometrical arrangement of the graduations [1, 2006.01]
15/06	• Free escapements [1, 2006.01]	19/10	• • Ornamental shape of the graduations or the surface of the dial; Attachment of graduations to the dial [1, 2006.01]
15/08	• • Lever escapements [1, 2006.01]	19/12	• • Selection of materials for dials or graduations [1, 2006.01]
15/10	• with constant impulses for the regulating mechanism [1, 2006.01]	19/14	• • Fastening the dials to the clock or the watch plates [1, 2006.01]

- 19/16 • • Shiftable dials, e.g. indicating alternately from 1 to 12 and from 13 to 24 [1, 2006.01]
- 19/18 • • Graduations on the crystal or glass, on the bezel, or on the rim [1, 2006.01]
- 19/20 • Indicating by numbered bands, drums, discs, or sheets [1, 2006.01]
- 19/21 • • Drums [3, 2006.01]
- 19/22 • Arrangements for indicating different local apparent times; Universal time-pieces [1, 2006.01]
- 19/23 • • by means of additional hands or additional pairs of hands [3, 2006.01]
- 19/24 • Clocks or watches with date indicators; Clockwork calendars [1, 2006.01]
- 19/243 • • characterised by the shape of the date indicator [3, 2006.01]
- 19/247 • • • disc-shaped [3, 2006.01]
- 19/25 • • • • Devices for setting the date indicators manually [3, 2006.01]
- 19/253 • • • • Driving or releasing mechanisms [3, 2006.01]
- 19/257 • • • drum-shaped [3, 2006.01]
- 19/26 • Clocks or watches with indicators for tides, for the phases of the moon, or the like [1, 2006.01]
- 19/28 • Adjustable guide marks or pointers for indicating determined points of time [1, 2006.01]
- 19/30 • Illumination of dials or hands [1, 2006.01]
- 19/32 • • by luminescent substances [1, 2006.01]
- 19/34 • Position of the hands projected optically [1, 2006.01]
- 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) [1, 2006.01]
- 21/02 • Regular striking mechanisms giving the full hour, half hour, or quarter hour [1, 2006.01]
- 21/04 • • Hour wheels; Racks or rakes; Snails or similar control mechanisms [1, 2006.01]
- 21/06 • • Details of striking mechanisms, e.g. hammer, fan governor [1, 2006.01]
- 21/08 • • Sounding bodies; Whistles; Musical apparatus (with electro-acoustic transmitters G04C 21/00) [1, 2006.01]
- 21/10 • • Releasing or locking the regular stroke, e.g. for silence during the night [1, 2006.01]
- 21/12 • • Reiterating watches or clocks [1, 2006.01]
- 21/14 • • Winding-up the striking mechanism by the clockwork; Winding-up the clockwork by the striking mechanism [1, 2006.01]
- 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) [1, 2006.01]
- 23/02 • Alarm clocks [1, 2006.01]
- 23/03 • • Alarm signal stop arrangements [3, 2006.01]
- 23/04 • • with coarse and fine setting of the preselected time [1, 2006.01]
- 23/06 • • adjustable for several preselected times with automatic stopping of the signal [1, 2006.01]
- 23/08 • • operating on successive days without resetting; operating only once in each 24 hours [1, 2006.01]
- 23/10 • • with presignal; with repeated signal; with changeable intensity of sound [1, 2006.01]
- 23/12 • • Alarm watches to be worn in pockets or on the wrist (giving signals by stimulating the skin G04B 25/04) [1, 2006.01]

- 25/00 Indicating the time by other means or by combined means** (electric or electromechanical indicating G04C) [1, 2006.01]
- 25/02 • by feeling; Clocks or watches for blind persons [1, 2006.01]
- 25/04 • • Alarm clocks or watches with devices stimulating the skin [1, 2006.01]
- 25/06 • by moving figures, e.g. cuckoo-clock, trumpet clock [1, 2006.01]
- 27/00 Mechanical devices for setting the time-indicating means** [1, 2006.01]
- 27/02 • by making use of the winding means [1, 2006.01]
- 27/04 • • with clutch wheel [1, 2006.01]
- 27/06 • • with rocking bar [1, 2006.01]
- 27/08 • by using parts of the case [1, 2006.01]

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

- 29/00 Frameworks** [1, 2006.01]
- 29/02 • Plates; Bridges; Cocks [1, 2006.01]
- 29/04 • Connecting or supporting parts [1, 2006.01]
- 31/00 Bearings; Point suspensions or counter-point suspensions; Pivot bearings; Single parts therefor** (bearings in general F16C) [1, 2006.01]
- 31/004 • characterised by the material used [3, 2006.01]
- 31/008 • • Jewel bearings (G04B 31/04 takes precedence) [3, 2006.01]
- 31/012 • • Metallic bearings [3, 2006.01]
- 31/016 • • Plastic bearings [3, 2006.01]
- 31/02 • Shock-damping bearings [1, 2006.01]
- 31/04 • • with jewel hole and cap jewel [3, 2006.01]
- 31/06 • Manufacture or mounting processes [3, 2006.01]
- 31/08 • Lubrication [3, 2006.01]
- 33/00 Calibers** [1, 2006.01]
- 33/02 • Circular calibers [1, 2006.01]
- 33/04 • Non-circular calibers [1, 2006.01]
- 33/06 • of extremely flat shape [1, 2006.01]
- 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) [1, 2006.01]
- 33/10 • with seconds hand arranged in the centre of the dial [1, 2006.01]
- 33/12 • for extremely-long running times [1, 2006.01]
- 33/14 • Calibers of which the mainsprings or barrels are easily removable (mainsprings G04B 1/14; barrels, arbors G04B 1/16) [1, 2006.01]
- 33/16 • with arrangements affording protection of the clockwork against damage as a consequence of a rupture of the mainspring [1, 2006.01]
- 35/00 Adjusting the gear train, e.g. the backlash of the arbors, depth of meshing of the gears** [1, 2006.01]

Protection of the clockwork against damage from outside

- 37/00 Cases** [1, 2006.01]
- 37/02 • Evacuated cases; Cases filled with gases or liquids; Cases containing substances for absorbing or binding moisture or dust [1, 2006.01]
- 37/04 • Mounting the clockwork in the case; Shock-absorbing mountings [1, 2006.01]

G04B

- 37/05 • • Fixed mountings for pocket or wrist watches [3, 2006.01]
- 37/06 • Forming the passage for the winding stem through the case; Divided winding stems [1, 2006.01]
- 37/08 • Hermetic sealing of openings, joints, passages, or slits [1, 2006.01]
- 37/10 • • of winding stems [1, 2006.01]
- 37/11 • • of the back cover of pocket or wrist watches [3, 2006.01]
- 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) [1, 2006.01]
- 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) [1, 2006.01]
- 37/16 • • Fastening the case to the bracelet [3, 2006.01]
- 37/18 • for pocket or wrist watches (G04B 37/02-G04B 37/16 takes precedence) [3, 2006.01]
- 37/20 • • with hinged covers or backs [3, 2006.01]
- 37/22 • Materials or processes of manufacturing pocket watch or wrist watch cases [3, 2006.01]

- 39/00 **Watch crystals; Fastening or sealing crystals; Clock glasses [1, 2006.01]**
- 39/02 • Sealing crystals or glasses [3, 2006.01]

- 41/00 **Locking or holding devices for pendulums, chimes, or the like, for use during transport [1, 2006.01]**

- 43/00 **Protecting clockworks by shields or other means against external influences, e.g. magnetic fields [1, 2006.01]**

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) [1, 2006.01]**
 - 45/02 • Time-pieces of which the clockwork is visible partly or wholly [1, 2006.01]
 - 45/04 • Time-pieces with invisible drive, e.g. with hands attached to rotating glass disc [1, 2006.01]

 - 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) [1, 2006.01]**
 - 47/02 • Installations within mirrors, pictures, furniture, or other household articles [1, 2006.01]
 - 47/04 • with attached ornaments or amusement apparatus [1, 2006.01]
 - 47/06 • with attached measuring instruments, e.g. pedometer, barometer, thermometer, compass [1, 2006.01]
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- 49/00 **Time-pieces using the position of the sun, moon, or stars [1, 2006.01]**
 - 49/02 • Sundials [1, 2006.01]
 - 49/04 • • Graduation or shaping of dials [1, 2006.01]

 - 99/00 **Subject matter not provided for in other groups of this subclass [2006.01]**