

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

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

Subclass Index

DRIVING MECHANISM	1/00	TIME SETTING.....	27/00
WINDING		FRAMEWORKS; SUPPORTS; CALIBERS	29/00; 31/00; 33/00
Normal; automatic; combined	3/00; 5/00; 7/00	PROTECTION OF CLOCKWORK	
Supervision; winding parts	9/00; 11/00	Cases; crystals, glasses; other	
CLOCK MOVEMENT		protection means	37/00; 39/00; 41/00, 43/00
Escapement; frequency stabiliser;		UNUSUAL CLOCKS	45/00, 47/00, 49/00
setting frequency gearwork;		SUBJECT MATTER NOT PROVIDED FOR	
adjusting thereof	15/00; 17/00; 18/00; 13/00; 35/00	IN OTHER GROUPS OF THIS SUBCLASS	99/00
TIME INDICATING.....	19/00, 21/00, 23/00, 25/00		

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; Clutches

- 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 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 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 to 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)
- 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	49/00	Time-pieces using the position of the sun, moon, or stars
47/06	• with attached measuring instruments, e.g. pedometer, barometer, thermometer, compass	49/02	• Sundials
		49/04	• Graduation or shaping of dials
<hr/>		99/00	Subject matter not provided for in other groups of this subclass [8]

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.

Subclass Index

ELECTRIC WINDING OF MECHANICAL CLOCKS	1/00	POWER SUPPLIES	10/00
ELECTROMECHANICAL CLOCK MOVEMENTS; ELECTRIC OR MAGNETIC ESCAPEMENTS	3/00, 5/00	SYNCHRONISATION; MASTER-AND-SLAVE CLOCK SYSTEM; SYNCHRONOUS-MOTOR CLOCKS	11/00; 13/00; 15/00
TIME INDICATING		CLOCKS FOR OPERATING A DEVICE AT A PRESELECTED TIME	23/00
Optical; acoustical means	17/00, 19/00; 21/00	SUBJECT MATTER NOT PROVIDED FOR IN OTHER GROUPS OF THIS SUBCLASS	99/00
TIME SETTING	9/00		

Electric winding of mechanical clocks; Independent electric clocks or watches

1/00 **Winding mechanical clocks electrically** (winding mechanically G04B 3/00)

- 1/02** . by electromagnets
- 1/04** . by electric motors with rotating or with reciprocating movement
- 1/06** . . winding-up springs
- 1/08** . . raising weights
- 1/10** . Protection against overwinding (in mechanical clocks or watches G04B 1/20, G04B 3/06, G04B 3/10)
- 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** (clocks driven by synchronous motors G04C 15/00)

- 3/02** . wherein movement is regulated by a pendulum
- 3/027** . . using electromagnetic coupling between electric power source and pendulum (G04C 3/033 takes precedence) [3]
- 3/033** . . using torsion pendulums; using conical pendulums (construction thereof G04B 17/00) [3]
- 3/04** . wherein movement is regulated by a balance
- 3/06** . . using electromagnetic coupling between electric power source and balance [3]
- 3/08** . wherein movement is regulated by a mechanical oscillator other than a pendulum or balance, e.g. by a tuning fork [3]
- 3/10** . . driven by electromagnetic means [3]
- 3/12** . . driven by piezo-electric means; driven by magneto-strictive means [3]
- 3/14** . incorporating a stepping motor (G04C 3/02 to G04C 3/12 take precedence) [3]

3/16	<ul style="list-style-type: none"> incorporating an electro-dynamic continuously rotating motor (G04C 3/02 to G04C 3/12 take precedence) [3]
3/18	<ul style="list-style-type: none"> incorporating electro-thermal or electro-pneumatic driving means [3]
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) [3]
9/00	Electrically-actuated devices for setting the time-indicating means (of slave clocks G04C 13/03; mechanical setting devices G04B 27/00) [3]
9/02	<ul style="list-style-type: none"> brought into action by radio transmission
9/04	<ul style="list-style-type: none"> by blocking the driving means [3]
9/06	<ul style="list-style-type: none"> by decoupling the driving means (combined with blocking means G04C 9/04) [3]
9/08	<ul style="list-style-type: none"> by electric drive [3]
10/00	Arrangements of electric power supplies in time-pieces [3]
10/02	<ul style="list-style-type: none"> the power supply being a radioactive source [3]
10/04	<ul style="list-style-type: none"> with means for indicating the condition of the power supply [3]

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 [8]

G04D APPARATUS OR TOOLS SPECIALLY DESIGNED FOR MAKING OR MAINTAINING CLOCKS OR WATCHES
(machine tools in general B23, B24; hand tools in general B25)

Subclass Index

HAND AND MACHINE TOOLS	1/00, 3/00	DEMAGNETISING DEVICES.....	9/00
LUBRICATING DEVICES	5/00	SUBJECT MATTER NOT PROVIDED FOR	
MEASURING AND TESTING APPARATUS	7/00	IN OTHER GROUPS OF THIS SUBCLASS	99/00

1/00 Gripping, holding, or supporting devices	5/00 Oiling devices; Special lubricant containers for watchmakers
1/02 . Tweezers; Vice clamps or other special hand tools for watchmakers	7/00 Measuring, counting, calibrating, testing, or regulating apparatus
1/04 . Tools for setting springs	7/02 . for mainsprings
1/06 . Supporting devices for clockworks or parts of time-pieces	7/04 . for gearwork
1/08 . Tools for setting or removing hands	7/06 . for escapements
1/10 . Devices for opening or closing watch bottoms or covers	7/08 . for balance wheels
3/00 Watchmakers' or watch-repairers' machines or tools for working materials	7/10 . for hairsprings
3/02 . Lathes, with one or more supports; Burnishing machines, with one or more supports	7/12 . Timing devices for clocks or watches for comparing the rate of the oscillating member with a standard
3/04 . Devices for placing bearing jewels, bearing sleeves, or the like in position	9/00 Demagnetising devices (demagnetising in general H01F 13/00)
3/06 . Devices for shaping or setting watch glasses	99/00 Subject matter not provided for in other groups of this subclass [8]
3/08 . Machines or apparatus for cleaning	

G04F TIME-INTERVAL MEASURING (measuring pulse characteristics G01R, e.g. G01R 29/02; in radar or like systems G01S; masers H01S 1/00; generation of oscillations H03B; generation or counting of pulses, frequency dividing H03K; analogue/digital conversion in general H03M 1/00) [2]

Note

This subclass covers:

- apparatus for measuring-off predetermined time intervals; [2]
- apparatus for producing such intervals as timing standards, e.g. metronomes; [2]
- apparatus for measuring unknown intervals, e.g. precision systems for short-time-interval measurement. [2]

Subclass Index

MEASURING PREDETERMINED TIME INTERVALS	MEASURING UNKNOWN TIME INTERVALS
Producing time standards	Mechanically; electromechanically;
Apparatus: without driving mechanisms; with driving mechanisms	electrically; otherwise.....
	7/00; 8/00; 10/00; 13/00

1/00 Apparatus which can be set and started to measure-off predetermined or adjustably-fixed time intervals without driving mechanisms, e.g. egg timer (time or time-programme switches which automatically terminate their operation after the programme is completed H01H 43/00)	3/00 Apparatus which can be set and started to measure-off predetermined or adjustably-fixed time intervals with driving mechanisms, e.g. dosimeter with clockwork (time or time-programme switches which automatically terminate their operation after the programme is completed H01H 43/00)
1/02 . by consuming prefixed quantities of materials, e.g. by burning candle	3/02 . with mechanical driving mechanisms
1/04 . by movement or acceleration due to gravity	3/04 . . Additional arrangements in connection with ordinary non-electric clocks for this purpose
1/06 . . by flowing-away of a prefixed quantity of fine-granular or liquid materials, e.g. sand-glass, water-clock	3/06 . with electric driving mechanisms
1/08 . . by a body falling a prefixed distance in air or in a viscous material	3/08 . . Additional arrangements in connection with ordinary electric clocks for this purpose

5/00	Apparatus for producing preselected time intervals for use as timing standards (generating clock signals for electric digital computers G06F 1/04; automatic frequency control or stabilisation of generators in general H03L)	8/00	Apparatus for measuring unknown time intervals by electromechanical means [2]
5/02	. Metronomes	8/02	. using an electromechanical oscillator [2]
5/04	. using oscillators with electromechanical resonators [2]	8/04	. . using a piezo-electric oscillator [2]
5/06	. . using piezo-electric resonators [2]	8/06	. . using a magnetostrictive oscillator [2]
5/08	. . using magnetostrictive resonators [2]	8/08	. Means used apart from the time-piece for starting or stopping same [2]
5/10	. using electric or electronic resonators (G04F 5/14 takes precedence) [2]	10/00	Apparatus for measuring unknown time intervals by electric means [2]
5/12	. using fluidic devices [2]	10/02	. using oscillators with passive electric resonator, e.g. lumped LC [2]
5/14	. using atomic clocks [2]	10/04	. by counting pulses or half-cycles of an ac [2]
5/16	. using pulses produced by radio-isotopes [2]	10/06	. by measuring phase [2]
7/00	Apparatus for measuring unknown time intervals by non-electric means (G04F 13/06 takes precedence) [2]	10/08	. using pulses produced by radio-isotopes [2]
7/02	. by measuring the distance of fall or the final velocity of a falling body	10/10	. by measuring electric or magnetic quantities changing in proportion to time [2]
7/04	. using a mechanical oscillator [2]	13/00	Apparatus for measuring unknown time intervals by means not provided for in groups G04F 5/00 to G04F 10/00 [2]
7/06	. . running only during the time interval to be measured, e.g. stop-watch	13/02	. using optical means [2]
7/08	. . Watches or clocks with stop devices, e.g. chronograph	13/04	. using electrochemical means [2]
7/10	. Means used apart from the time-piece for starting or stopping same [2]	13/06	. using fluidic means [2]

G04G ELECTRONIC TIME-PIECES [3]

Notes

- (1) This subclass covers:
 - electronic time-pieces with no moving parts; [3]
 - electronic circuitry for producing timing pulses irrespective of the nature of the time-indicating means utilised. [3]
- (2) This subclass does not cover electronic time-pieces with moving parts, which are covered by subclass G04C. [3]

Subclass Index

PRODUCING TIMING PULSES	3/00
TIME-SETTING; SYNCHRONISING	5/00; 7/00
TIME- OR DATE-INDICATING	
Visual; optical signals; acoustic	
signals	9/00; 11/00; 13/00

OPERATING A DEVICE AT PRESELECTED	
TIMES	15/00
STRUCTURAL DETAILS; HOUSINGS	17/00
ELECTRIC POWER SUPPLY CIRCUITS	19/00
OTHER SUBJECTS	1/00

1/00	Subject matter not provided for in groups G04G 3/00 to G04G 19/00 [3,7]	3/00	Producing timing pulses (driving circuits for stepping motors G04C 3/14; producing preselected time intervals for use as timing standards G04F 5/00; pulse technique in general H03K; control, synchronisation, or stabilisation of generators in general H03L) [3]
1/02	. Input or output devices integrated in time-pieces [7]	3/02	. Circuits for deriving low frequency timing pulses from pulses of higher frequency (pulse frequency dividers in general H03K 23/00 to H03K 29/00) [3]
1/04	. . Detectors of external physical values, e.g. temperature [7]	3/04	. Temperature-compensating arrangements [7]
1/06	. . using radio waves [7]	5/00	Setting, i.e. correcting or changing, the time-indication [3]
1/08	. . using voice [7]	5/02	. by temporarily changing the number of pulses per unit time, e.g. quick-feed method [3]
1/10	. . Touch switches specially adapted for time-pieces [7]	5/04	. by setting each of the displayed values, e.g. date, hour, independently [3]

7/00	Synchronisation [3]	15/00	Time-pieces comprising means to be operated at preselected times or after preselected time intervals (G04G 11/00, G04G 13/00 take precedence; pulse delay circuits H03K 5/13; electronic time-delay switches H03K 17/28; electronic time-programme switches which automatically terminate their operation after the programme is completed H03K 17/296; time programming for television signal recording H04N 5/761) [3]
7/02	. by radio [3]		
9/00	Visual time or date indication means [3]	17/00	Structural details; Housings [7]
9/02	. by selecting desired characters out of a number of characters or by selecting indicating elements the position of which represent the time, e.g. by using multiplexing techniques [3]	17/02	. Component assemblies [7]
9/04	. . by controlling light sources, e.g. electroluminescent diodes [3]	17/04	. . Mounting of electronic components [7]
9/06	. . using light valves, e.g. liquid crystals [3]	17/06	. . Electric connectors, e.g. conductive elastomers [7]
9/08	. by building-up characters using a combination of indicating elements, e.g. by using multiplexing techniques [3]	17/08	. Housings [7]
9/10	. . by controlling light sources, e.g. electroluminescent diodes [3]	19/00	Electric power supply circuits specially adapted for use in electronic time-pieces [7]
9/12	. . using light valves, e.g. liquid crystals [3]	19/02	. Conversion or regulation of current or voltage [7]
11/00	Producing optical signals at preselected times [3]	19/04	. . Capacitive voltage division or multiplication [7]
13/00	Producing acoustic time signals [3]	19/06	. . Regulation [7]
13/02	. at preselected times, e.g. alarm clocks [3]	19/08	. Arrangements for preventing voltage drop due to overloading the power supply [7]
		19/10	. Arrangements for supplying back-up power [7]
		19/12	. Arrangements for reducing power consumption during storage [7]