

14	Ångmaskiner; Ångkraftanläggningar; Ångackumulatorer oberoende av ångpannor	[-69]
14	(IPC: F01) Machines or engines in general; Engine plants in general; Steam engines	[69-]
14a	Ångmaskiner med fram-och-återgående kolvar	[-69]
14a	(IPC: F01B) Machines or engines, in general or of positive-displacement type	[69-]
14b	Ångmaskiner med roterande kolvar; Liknande maskiner för andra drivmedel	[-69]
14b	(IPC: F01C) Rotary-piston or oscillating-piston machines or engines	[69-]
14c	Ångturbiner; Luftturbiner	[-69]
14c	(IPC: F01D) Non-positive-displacement machines or engines	[69-]
14d	Glidslidregleringar för ångmaskiner med fram-och-återgående kolvar	[-69]
14d	(IPC: F01L) Cyclically operating valves for machines or engines	[69-]
14e	Vridslidregleringar för ångmaskiner med fram-och-återgående kolvar; Andra regleranordningar som inte omfattas av 14d eller 14f	[-69]
14f	Ventilregleringar för ångmaskiner med fram-och-återgående kolvar	[-69]
14g	Tillbehör till ångmaskiner; Balanseringsanordningar för svänghjulslösa pumpar och kompressorer; Kondensorer i anslutning till ångmaskiner	[-69]
14h	Speciella anordningar för utnyttjande av ångkraft; Ångackumulatorer oberoende av ångpannor	[-69]
14h	(IPC: F01K) Steam engine plants; Steam accumulators; Engine plants not otherwise provided for; Engines using special working fluids or cycles	[69-]
14i	(IPC: F01M) Lubricating of machines or engines in general; Lubricating internal-combustion engines	[69-]
14k	(IPC: F01N) Gas-flow silencers or exhaust apparatus for machines or engines in general; Gas-flow silencers or exhaust apparatus for internal combustion engines	[69-]
14l	(IPC: F01P) Cooling of machines or engines in general; Cooling of internal combustion engines	[69-]
14a	Ångmaskiner med fram-och-återgående kolvar	[-69]
14a-1	Lokomotivångmaskiner (drivanordningar 20b-10)	[-69]

14a-2	Till en enhet sammanbyggda ångkraftanläggningar; Stationära eller körbara lokomobiler; Småångmaskiner	[-69]
14a-3	Enkelverkande maskiner (14a-13; 14a-14)	[-69]
14a-4	Dubbelverkande maskiner	[-69]
14a-5	Maskiner med tvåstegsexpansion eller flerstegsexpansion	[-69]
14a-6	Tandemmaskiner	[-69]
14a-7	Maskiner med differentialkolvar	[-69]
14a-8	Maskiner med flera mot varandra löpande kolvar	[-69]
14a-9	Maskiner utan vevstake eller vevaxel; Speciella anordningar	[-69]
14a-10	Maskiner med rörliga cylindrar, t.ex. teleskopformade	[-69]
14a-11	Maskiner med svängande cylindrar	[-69]
	Maskiner med parallellt med huvudaxeln liggande cylindrar (59a; 46a10)	[-69]
14a-12/01	med vingelskivedrivning	[-69]
14a-12/02	med kurvskivedrivning för flera cylindrar	[-69]
14a-12/03	med drillborrliknande drivning av kolven	[-69]
14a-12/04	med spårskivedrivning	[-69]
	Ångmaskiner med radiellt anordnade cylindrar	[-69]
14a-13	med cylindrarna omväxlande roterande och stillastående	[-69]
14a-14	med cylindrarna stillastående	[-69]
14a-15	Utbalansering (46a11; 47h-20; 47h-25; 47h-26; 65f2-6); Anordningar för utjämning av utvidgningen eller av vridande momentet hos enskilda delar (14c-22; 42c-42)	[-69]
	Maskinelement för kolvångmaskiner (i allmänhet 47b, 47f)	[-69]
14a-16/01	Stativ	[-69]
14a-16/02	Vevrörelser	[-69]
14a-16/03	Kolvar; Kolvstänger	[-69]
14a-16/04	Tvärstycken	[-69]
14a-16/05	Rörledning	[-69]
14a-16/06	Vevstakar	[-69]
14a-16/07	Packningsboxar	[-69]
14a-16/08	Vevaxlar; Vevaxellager	[-69]
14a-16/09	Cylindrar	[-69]
14a-17	Likströmsångmaskiner	[-69]
14a-18	Drivning av arbetsmaskiner eller kraftöverföringsanordningar (14c-14; 65f1; 65f2)	[-69]
14a-19	Avloppsångmaskiner; Avtappningsmaskiner; Mottrycksmaskiner (14c-17)	[-69]
14a-20	Ångmaskiner med efterkopplade avloppsångmaskiner (avloppsångturbiner 14c-17)	[-69]

14a (IPC: F01B) Machines or engines, in general or of positive-displacement type, e.g. steam engines (of rotary-piston or oscillating-piston type 14b; of non-positive-displacement type 14c; crankshafts, crossheads, connecting-rods 47b; flywheels 47a3; gearings for interconverting rotary motion and reciprocating motion in general 47h; pistons, piston-rods, cylinders, for engines in general 47f2) **[69-]**

Note: **[69-]**
This subclass comprises the following subject-matter, except the matter provided for in subclasses 14b to 14l:
(a) engines for elastic fluids, e.g. steam engines,
(b) engines for liquids and elastic fluids,
(c) machines for elastic fluids,
(d) machines for liquids and elastic fluids. **[69-]**

14a-1/00 Multi-cylinder reciprocating-piston machines or engines (14a-3/00, 14a-5/00 take precedence) **[69-]**

- 14a-1/02 . with cylinders all in one line **[69-]**
- 14a-1/04 . with cylinders in V-arrangement **[69-]**
- 14a-1/06 . with cylinders in star or fan arrangement **[69-]**
- 14a-1/08 . with cylinders arranged oppositely relative to main shaft and of "flat" type **[69-]**
- 14a-1/10 . with more than one main shaft, e.g. coupled to common output shaft (combinations of two or more machines or engines 14a-21/00) **[69-]**
- 14a-1/12 . Separate cylinder-crankcase elements coupled together to form a unit **[69-]**

14a-3/00 Reciprocating-piston machines or engines with cylinder axes coaxial with, or parallel or inclined to, main shaft axis **[69-]**

- 14a-3/02 . with wobble-plate **[69-]**
- 14a-3/04 . the piston motion being transmitted by curved surfaces **[69-]**
- 14a-3/06 . . by multi-turn helical surfaces and automatic reversal **[69-]**
- 14a-3/08 . . . the helices being arranged on the pistons **[69-]**
- 14a-3/10 . Control of working-fluid admission or discharge peculiar thereto (suitable for more general application 14d) **[69-]**

14a-5/00 Reciprocating-piston machines or engines with cylinder axes arranged substantially tangentially to a circle centred on main shaft axis **[69-]**

14a-7/00 Machines or engines with two or more pistons reciprocating within same cylinder or within essentially coaxial cylinders (in opposite arrangement relative to main shaft 14a-1/08) **[69-]**

- 14a-7/02 . with oppositely reciprocating pistons **[69-]**
- 14a-7/04 . . acting on same main shaft **[69-]**
- 14a-7/06 . . . using only connecting-rods for conversion of reciprocatory into rotary motion or vice versa **[69-]**
- 14a-7/08 with side rods **[69-]**
- 14a-7/10 having piston-rod of one piston passed through other piston **[69-]**
- 14a-7/12 . . . using rockers and connecting-rods **[69-]**
- 14a-7/14 . . acting on different main shafts **[69-]**
- 14a-7/16 . with pistons synchronously moving in tandem arrangement **[69-]**
- 14a-7/18 . with differential piston (14a-7/20 takes precedence) **[69-]**
- 14a-7/20 . with two or more pistons reciprocating one within another, e.g. one piston forming cylinder of the other **[69-]**

14a-9/00 Reciprocating-piston machines or engines characterised by connections between pistons and main shafts and not specific to preceding groups (connections disengageable during idling 14a-31/24) **[69-]**

- 14a-9/02 . with crankshaft **[69-]**
- 14a-9/04 . with rotary main shaft other than crankshaft **[69-]**
- 14a-9/06 . . the piston motion being transmitted by curved surfaces **[69-]**
- 14a-9/08 . . with ratchet and pawl **[69-]**

14a-11/00	Reciprocating-piston machines or engines without rotary main shaft, e.g. of free-piston type	[69-]
14a-11/02	. Equalising or cushioning devices	[69-]
14a-11/04	. Engines combined with reciprocatory driven devices, e.g. hammers (with pumps 14a-23/08; predominating aspects of driven devices, see the relevant classes for the devices)	[69-]
14a-11/06	. . for generating vibration only	[69-]
14a-11/08	. with direct fluid transmission link (14a-11/02 takes precedence)	[69-]
14a-13/00	Rotary machines or engines in which the working fluid is exclusively displaced by or, exclusively, displaced one or more reciprocating pistons	[69-]
14a-13/02	. with one cylinder only	[69-]
14a-13/04	. with more than one cylinder	[69-]
14a-13/06	. . in star arrangement	[69-]
14a-15/00	Reciprocating-piston machines or engines with movable cylinders other than provided for in 14a-13/00 (with movable cylinder sleeves for working-fluid control 14d)	[69-]
14a-15/02	. with reciprocating cylinders (with one piston within another 14a-7/20)	[69-]
14a-15/04	. with oscillating cylinder	[69-]
14a-15/06	. . Control of working-fluid admission or discharge peculiar thereto	[69-]
14a-17/00	Reciprocating-piston machines or engines characterised by use of uniflow principle	[69-]
14a-17/02	. Engines	[69-]
14a-17/04	. . Steam engines	[69-]
14a-19/00	Positive-displacement machines or engines of flexible-wall type	[69-]
14a-19/02	. with plate-like flexible members	[69-]
14a-19/04	. with tubular flexible members	[69-]
14a-21/00	Combinations of two or more machines or engines (14a-23/00 takes precedence; regulating or controlling, see the relevant groups; combinations of two or more pumps 59a, 27b; fluid gearing 47h)	[69-]
14a-21/02	. the machines or engines being all of reciprocating-piston type	[69-]
14a-21/04	. the machines or engines being not all of reciprocating-piston type, e.g. of reciprocating steam engine with steam turbine	[69-]
14a-23/00	Adaptations of machines or engines for special use; Combinations of engines with devices driven thereby (14a-11/00 takes precedence, aspects predominantly concerning driven devices see the relevant classes for these devices; regulating or controlling, see the relevant groups; fluid gearing 47h)	[69-]
14a-23/02	. Adaptations for driving vehicles, e.g. locomotives (arrangements in vehicles, see the relevant classes for vehicles)	[69-]
14a-23/04	. . the vehicles being waterborne vessels	[69-]
14a-23/06	. Adaptations for driving, or combinations with, hand-held tools or the like	[69-]
14a-23/08	. Adaptations for driving, or combinations with, pumps	[69-]
14a-23/10	. Adaptations for driving, or combinations with, electric generators	[69-]
14a-23/12	. Adaptations for driving rolling mills or other heavy reversing machinery	[69-]
14a-25/00	Regulating, controlling, or safety means (regulating or controlling in general 42r)	[69-]
14a-25/02	. Regulating or controlling by varying working-fluid admission or exhaust, e.g. by varying pressure or quantity (distributing or expansion valve gear 14d)	[69-]
14a-25/04	. . Sensing elements	[69-]
14a-25/06	. . . responsive to speed	[69-]
14a-25/08	. . Final actuators	[69-]
14a-25/10	. . . Arrangements or adaptations of working-fluid admission for discharge valves (valves per se 47g1)	[69-]

14a-25/12	. . Devices dealing with sensing elements or final actuators or transmitting means between them, e.g. power-assisted (sensing elements alone 14a-25/04; final actuators alone 14a-25/08)	[69-]
14a-25/14	. . peculiar to particular kinds of machines or engines	[69-]
14a-25/16	. Safety means responsive to specific conditions (against water hammer or the like in steam engines 14a-31/34)	[69-]
14a-25/18	. . preventing rotation in wrong direction	[69-]
14a-25/20	. Checking operation of safety devices	[69-]
14a-25/22	. Braking by redirecting working fluid	[69-]
14a-25/24	. . thereby regenerating energy	[69-]
14a-25/26	. Warning devices	[69-]
14a-27/00	Starting of machines or engines (starting combustion engines 46l)	[69-]
14a-27/02	. of reciprocating-piston engines	[69-]
14a-27/04	. . by directing working-fluid supply, e.g. by aid of by-pass steam conduits	[69-]
14a-27/06	. . . specially for compound engines	[69-]
14a-27/08	. . Means for moving crank off dead-centre (turning-gear in general 47h)	[69-]
14a-29/00	Machines or engines with pertinent characteristics other than those provided for in preceding main groups	[69-]
14a-29/02	. Atmospheric engines, i.e. atmosphere acting against vacuum	[69-]
14a-29/04	. characterised by means for converting from one type to a different one	[69-]
14a-29/06	. . from steam engine into combustion engine	[69-]
14a-29/08	. Reciprocating-piston machines or engines not otherwise provided for	[69-]
14a-29/10	. . Engines (refrigerating expansion engines 17a)	[69-]
14a-29/12	. . . Steam engines (toy steam engines 77f-25/00)	[69-]
14a-31/00	Component parts, details, or accessories not provided for in, or of interest apart from, other groups (machine or engine casings, other than those peculiar to steam engines, 47a2)	[69-]
14a-31/02	. De-icing means for engines having icing phenomena	[69-]
14a-31/04	. Means for equalising torque in reciprocating-piston machines or engines (compensation of inertial forces, suppression of vibration in systems 47a3)	[69-]
14a-31/06	. Means for compensating relative expansion of component parts	[69-]
14a-31/08	. Cooling of steam engines (cooling of fluid machines or engines in general 14l); Heating; Heat insulation (heat insulation in general 47f1-59/00)	[69-]
14a-31/10	. Lubricating arrangements of steam engines (of fluid machines or engines in general 14i)	[69-]
14a-31/12	. Arrangements of measuring or indicating devices (warning apparatus 14a-25/26; measuring instruments or the like per se 42)	[69-]
14a-31/14	. Changing of compression ratio	[69-]
14a-31/16	. Silencers specially adapted for steam engines (arrangements of exhaust pipes or tubes on steam engines 14a-31/30; gas-flow silencers or exhaust silencers for machines or engines in general 14k)	[69-]
14a-31/18	. Draining	[69-]
14a-31/20	. . of cylinders	[69-]
14a-31/22	. Idling devices, e.g. having by-passing valves	[69-]
14a-31/24	. . Disengagement of connections between pistons and main shafts	[69-]
14a-31/26	. Other component parts, details, or accessories, peculiar to steam engines	[69-]
14a-31/28	. . Cylinders or cylinder covers	[69-]
14a-31/30	. . Arrangements of steam conduits	[69-]
14a-31/32	. . Arrangements or adaptations of vacuum breakers	[69-]
14a-31/34	. . Safety means against water hammer or against the penetration of water (steam traps per se 47g2)	[69-]
14a-31/36	. . . automatically cutting-off steam supply	[69-]

14b Ångmaskiner med roterande kolvar; Liknande maskiner för andra drivmedel (27c-1 – 27c-6; 42e-7; 46a5; 46d-5/01; 46d-5/05; 47f-22; 47f-26; 47h-18; 69e; 63c-34; 88b-2) **[-69]**

14b-1/01 Maskiner med tryckpåverkade tätningsslidor [skjutbart vederlag] i allmänhet [-69]

14b-1/02	Maskiner med tvångsstyrda tätningsslider i allmänhet	[-69]
14b-1/03	Maskiner med tätningsslider parallella med axeln	[-69]
14b-2/01	Maskiner med vridbara eller svängbara tätningsslider [vederlag], t.ex. klaffmade, i kolvens rotationsplan	[-69]
14b-2/02	Maskiner med vridbara eller svängbara tätningsslider, t.ex. klaffmade, vinkelrätt mot kolvens rotationsplan	[-69]
14b-2/03	Maskiner med i kolvens rotationsplan likformigt eller stegvis roterande tätningsslider	[-69]
14b-2/04	Maskiner med vinkelrätt mot kolvens rotationsplan likformigt eller stegvis roterande tätningsslider	[-69]
14b-3/01	Maskiner med tryckpåverkade skivkolvar, i allmänhet	[-69]
14b-3/02	Maskiner med tvångsstyrda skivkolvar, i allmänhet	[-69]
14b-3/03	Maskiner med skivkolvar parallella med axeln	[-69]
14b-4/01	Maskiner med vid rotorn fästa likformigt eller stegvis svängbara eller vridbara element som vridkolvar, i allmänhet	[-69]
14b-4/02	Maskiner med vid rotorn fästa likformigt eller stegvis svängbara eller vridbara element parallella med axeln som vridkolvar	[-69]
14b-5	Maskiner med växelvis rörliga och stillastående kolvar	[-69]
14b-6	Maskiner med kolvar med varierande vinkelhastighet	[-69]
14b-7/01	Kugghjulsmaskiner eller maskiner med på kugghjulslignande sätt med varandra samverkande rotor, i allmänhet	[-69]
14b-7/02	Kugghjulsmaskiner eller maskiner med på kugghjulslignande sätt med varandra samverkande rotor, med pilkuggning	[-69]
14b-7/03	Kugghjulsmaskiner eller maskiner med på kugghjulslignande sätt med varandra samverkande rotor, med inre ingrepp	[-69]
14b-8	Maskiner med svängkolvar	[-69]
14b-9	Maskiner med vevstaksrörelse hos kolven eller vederlaget	[-69]
14b-10/01	Maskiner med två i varandra ingripande skruvkolvar	[-69]
14b-10/02	Maskiner av typen skruv och snäcka, t.ex. med globoidskruvar	[-69]
14b-11/01	Maskiner med hus av kulliknande, kalottliknande eller liknande form	[-69]
14b-11/02	Maskiner med tvåhörnt, trehörnt eller flerhörnt hus	[-69]
14b-11/03	Maskiner med medroterande hus och i huset eller rotorn förskjutbar kolv	[-69]
14b-11/04	Slangmaskiner; Bandmaskiner	[-69]
14b-11/10	Maskiner med speciell utformning	[-69]
14b-12/01	Tätningar	[-69]
14b-12/02	Omkastningsanordningar; Anordningar för reglering av fyllningsgraden	[-69]
14b-12/03	Smörjning; Uppvärmning; Kylning	[-69]
14b-12/04	Andra anordningar	[-69]

14b (IPC: F01C) Rotary-piston or oscillating-piston machines or engines [69-]

Notes: [69-]

- 1. The subject-matter of this subclass comprises:**
- (a) rotary-piston or oscillating-piston engines for elastic fluids, e.g. steam,**
 - (b) rotary-piston or oscillating-piston engines for liquids and elastic fluids,**
 - (c) rotary-piston or oscillating-piston machines for liquids and elastic fluids. [69-]**
- 2. In this subclass, the term "rotary-piston machine" embraces the German terms "Drehkolbenmaschinen", "Kreiskolbenmaschinen", and "Umlaufkolbenmaschinen". [69-]**

14b-1/00 Rotary-piston machines or engines (with axes of co-operating members non-parallel 14b-3/00; with the working-chamber walls at least partly resiliently deformable 14b-5/00; with fluid ring or the like 14b-7/00; rotary-piston machines or engines in which the working fluid is exclusively displaced by, or exclusively displaces, one or more reciprocating pistons 14a-13/00) [69-]

- 14b-1/02 . of arcuate-engagement type, i.e. with circular translatory movement of co-operating members [69-]
- 14b-1/04 . . of internal-axis type [69-]
- 14b-1/06 . . of other than internal-axis type (coaxial type 14b-1/42) [69-]
- 14b-1/08 . of intermeshing-engagement type, i.e. with engagement of co-operating members similar to that of toothed gearing [69-]
- 14b-1/10 . . of internal-axis type with the outer member having more teeth or tooth-equivalents, than the inner member [69-]
- 14b-1/12 . . of other than internal-axis type [69-]
- 14b-1/14 . . . with toothed rotary pistons [69-]
- 14b-1/16 with helical teeth, e.g. chevron-shaped, screw type [69-]
- 14b-1/18 with similar tooth forms (14b-1/16 takes precedence) [69-]
- 14b-1/20 with dissimilar tooth forms (14b-1/16 takes precedence) [69-]
- 14b-1/22 . of internal-axis type with equidirectional movement of co-operating members at the points of interengagement the inner member having more teeth or tooth-equivalents than the outer member [69-]
- 14b-1/24 . of counter-engagement type, i.e. the movement of co-operating members at the points of interengagement being in opposite directions [69-]
- 14b-1/26 . . of internal-axis type [69-]
- 14b-1/28 . . of other than internal-axis type [69-]
- 14b-1/30 . Rotary-piston machines or engines not restricted to only one of the subgroups 14b-1/02, 14b-1/08, 14b-1/22 or 14b-1/24 [69-]
- 14b-1/32 . . having both the movements defined in subgroup 14b-1/02 and relative reciprocation between members [69-]
- 14b-1/34 . . having the movements defined in subgroup 14b-1/08 or 14b-1/22 and relative reciprocation between members [69-]
- 14b-1/36 . . having both the movements defined in subgroups 14b-1/22 and 14b-1/24 [69-]
- 14b-1/38 . . having the movement defined in 14b-1/02 and having a hinged member [69-]
- 14b-1/40 . . having the movement defined in 14b-1/08 and having a hinged member [69-]
- 14b-1/42 . . with coaxially-mounted members have continuously-changing circumferential distance [69-]

14b-3/00 Rotary-piston machines or engines with non-parallel axes of movement of co-operating members (with the working-chamber walls being at least partly resiliently deformable 14b-5/00) [69-]

- 14b-3/02 . the axes being arranged at an angle of 90° [69-]
- 14b-3/04 . . with axially-sliding vanes [69-]
- 14b-3/06 . the axes being arranged otherwise than at an angle of 90° [69-]
- 14b-3/08 . . of intermeshing-engagement type, i.e. with engagement of co-operating members similar to that of toothed gearing [69-]

14b-5/00	Rotary-piston machines or engines with the working-chamber walls at least partly resiliently deformable	[69-]
14b-5/02	. the resiliently-deformable wall being part of the inner member, e.g. of a rotary piston	[69-]
14b-5/04	. the resiliently-deformable wall being part of the outer member, e.g. of a housing	[69-]
14b-5/06	. the resiliently-deformable wall being a separate member	[69-]
14b-5/08	. . of tubular form, e.g. hose	[69-]
14b-7/00	Rotary-piston machines or engines with fluid ring or the like	[69-]
14b-9/00	Oscillating-piston machines or engines	[69-]
14b-11/00	Combinations of two or more machines or engines, each being of rotary-piston or oscillating-piston type (14b-13/00 takes precedence; fluid gearing 47h)	[69-]
14b-13/00	Adaptations of machines or engines for special use; Combinations of engines with devices driven thereby (aspects predominantly concerning driven devices, see the relevant classes for these devices)	[69-]
14b-13/02	. for driving hand-held tools or the like	[69-]
14b-13/04	. for driving pumps or compressors	[69-]
14b-17/00	Arrangements for drive of co-operating members, e.g. for rotary piston and casing	[69-]
14b-17/02	. of toothed-gearing type	[69-]
14b-17/04	. of cam-and-follower type	[69-]
14b-17/06	. using cranks, universal joints, or similar elements	[69-]
14b-19/00	Sealing arrangements in rotary-piston machines or engines (sealings in general 47f2)	[69-]
14b-19/02	. Radially-movable sealings for working fluids	[69-]
14b-19/04	. . of rigid material	[69-]
14b-19/06	. . of resilient material	[69-]
14b-19/08	. Axially-movable sealings for working fluids	[69-]
14b-19/10	. Sealings for working fluids between radially and axially movable parts	[69-]
14b-19/12	. for other than working fluid	[69-]
14b-21/00	Component parts, details, or accessories, not provided for in, or of interest apart from, other groups	[69-]
14b-21/02	. Arrangements of bearings (bearing constructions 47b)	[69-]
14b-21/04	. Lubrication (of machines or engines in general 14i)	[69-]
14b-21/06	. Heating; Cooling (of machines or engines in general 14l); Heat insulation (heat insulation in general 47f1)	[69-]
14b-21/08	. Rotary pistons (reciprocating pistons in general 47f2)	[69-]
14b-21/10	. Outer members for co-operation with rotary pistons; Casings (casings for rotary engines or machines in general 47a2)	[69-]
14b-21/12	. Control of working-fluid admission or discharge (suitable for more general application 14d)	[69-]
14b-21/14	. . for variable fluid distribution	[69-]
14b-21/16	. Other regulation or control	[69-]
14c	Ångturbiner; Luftturbiner (gasturbiner 46f; vattenturbiner 88a)	[-69]
14c-1	Aktionshjul	[-69]
14c-2	Reaktionshjul	[-69]
14c-3	Friktionsturbiner; Skruvturbiner	[-69]
14c-4/01	Aktionsturbiner med axiell påströmning	[-69]
14c-4/02	Aktionsturbiner med radiell påströmning	[-69]
14c-4/03	Aktionsturbiner med upprepad påströmning på samma löphjul	[-69]
14c-5	Kombinerade aktionsturbiner och reaktionsturbiner	[-69]
14c-6/01	Reaktionsturbiner med axiell påströmning	[-69]
14c-6/02	Reaktionsturbiner med radiell påströmning	[-69]

14c-7/01	Dubbelroterande turbiner med axiell påströmning	[-69]
14c-7/02	Dubbelroterande turbiner med radiell påströmning	[-69]
14c-8/01	Munstycksreglering	[-69]
14c-8/02	Ventilreglering (14f; 47g)	[-69]
14c-8/03	Mekaniska regleringsanordningar (14f; 47g)	[-69]
14c-8/04	Hydrauliska regleringsanordningar (14f-8)	[-69]
14c-8/05	Elektriska regleringsanordningar	[-69]
14c-8/06	Säkringsanordningar; Anordningar för kontroll av ångans tillstånd eller temperatur i turbinen	[-69]
14c-8/07	Omkastningsanordningar	[-69]
14c-9	Turbiner för flera ångor eller ångblandningar (13g-4/01); Kallångturbiner	[-69]
14c-10/01	Överhettning; Mellanöverhettning	[-69]
14c-10/02	Uppvärmning; Torkning	[-69]
14c-10/03	Anordningar för avlägsnande av fuktighet	[-69]
14c-10/04	Kylning	[-69]
	Löpskovlar (framställning 7c; 49I-7)	[-69]
14c-11/01	Skovelform	[-69]
14c-11/02	Skovelfästning	[-69]
14c-11/03	Skovelringar; Förstyvningar	[-69]
14c-11/04	Skovellåsanordningar	[-69]
14c-11/05	Material; Erosionskydd; Korrosionsskydd	[-69]
14c-11/06	Vridbara skovlar; Eftergivliga skovlar	[-69]
	Ledskeneanordningar	[-69]
14c-12/01	Munstycken; Framställning eller infästning av munstycken	[-69]
14c-12/02	Ledskenor; Ledskenekransar	[-69]
14c-13/01	Ångavlopp; Kondensoranläggningar	[-69]
14c-13/02	Utnyttjande av avloppsånga från ångturbiner; Matarvattenförvärmning eller beredning av matarvatten med hjälp av turbinånga (13b; 14h)	[-69]
14c-14	Drivning av arbetsmaskiner med turbiner (47b-20; 65f1-2); Turbinkraftanläggningar; Reglering av turbinkraftanläggningar	[-69]
14c-15	Fartygsturbiner (65f1)	[-69]
14c-16	Lokomotivturbiner (20b)	[-69]
14c-17/01	Avloppsångturbiner; Tillgodogörande av avloppsånga i turbiner; Reglering av avloppsångturbiner (14a-20)	[-69]
14c-17/02	Avtappningsturbiner; Mottrycksturbiner (14a-19); Reglering av sådana	[-69]
14c-17/03	Tvåtrycksturbiner; Flertrycksturbiner; Reglering av sådana	[-69]
14c-17/04	Turbiner för ackumulatorånga eller tillsatsånga; Reglering av sådana (14h-3)	[-69]
14c-17/05	Hjälpturbiner; Reglering av sådana	[-69]
14c-18	Avlastning	[-69]
14c-19/01	Lagring (47b-4 – 47b-12; 88a)	[-69]
14c-19/02	Smörjning (47e)	[-69]
14c-19/03	Uppställning av turbinhuset (47a-16)	[-69]
14c-20/01	Packningsboxar (47f-23; 47f-24); Vätsketätningar	[-69]
14c-20/02	Labyrinttätningar (47f-26); Användning av spärrånga	[-69]
14c-21	Spalttätningar	[-69]
14c-22/01	Turbinhus	[-69]
14c-22/02	Turbinhjul; Turbinrotorer; Undvikande av skadliga svängningspåkänningar (uppmätning av svängningspåkänningar 42c-42)	[-69]
14c-22/03	Fundament (37f; 47a-16); Hopbyggnad med ångpanna; Rostskydd	[-69]
	Luftturbiner	[-69]
14c-23/01	Tryckluftturbiner (46d-5/03)	[-69]

14c-23/02	Vacuumturbiner (46d-5/08)	[69-]
14c-23/03	Förhindrande av isbildning i luftturbiner	[69-]

14c (IPC: F01D) Non-positive displacement machines or engines, e.g. steam turbines [69-]

Note: [69-]

The subject-matter of this subclass comprises:

- (a) non-positive-displacement engines for elastic fluids, e.g. steam turbines,**
- (b) non-positive-displacement engines for liquids and elastic fluids,**
- (c) non-positive-displacement machines for elastic fluids,**
- (d) non-positive-displacement machines for liquids and elastic fluids. [69-]**

14c-1/00 Non-positive-displacement machines or engines, e.g. steam turbines (with working-fluid in opposite axial directions for balancing axial thrust 14c-3/02; with other than pure rotation 14c-23/00; turbines characterised by their use in special steam systems, cycles, or processes, regulating devices therefor 14h) [69-]

- 14c-1/02 . with stationary working-fluid guiding means and bladed or like rotor, e.g. multi-bladed impulse steam turbines (of reaction type 14c-1/18) [69-]
- 14c-1/04 . . traversed by the fluid substantially axially [69-]
- 14c-1/06 . . traversed by the fluid substantially radially [69-]
- 14c-1/08 . . . having inward flow [69-]
- 14c-1/10 . . having two or more stages subjected to working-fluid flow without essential intermediate pressure change, i.e. with velocity stages (14c-1/12 takes precedence) [69-]
- 14c-1/12 . . with repeated action on same blade ring [69-]
- 14c-1/14 . . . traversed by the fluid substantially radially [69-]
- 14c-1/16 . . characterised by having both reaction stages and impulse stages [69-]
- 14c-1/18 . of reaction type (with pressure-velocity transformation exclusively in rotor 14c-1/32) [69-]
- 14c-1/20 . . traversed by the fluid substantially axially [69-]
- 14c-1/22 . . traversed by the fluid substantially radially [69-]
- 14c-1/24 . characterised by contra-rotating rotors subjected to same working-fluid stream without intermediate stator blades or the like [69-]
- 14c-1/26 . . traversed by the fluid substantially axially [69-]
- 14c-1/28 . . traversed by the fluid substantially radially [69-]
- 14c-1/30 . characterised by having a single rotor operable in either direction of rotation, e.g. by reversing of blades (combinations of machines or engines 14c-13/00) [69-]
- 14c-1/32 . with pressure-velocity transformation exclusively in rotor [69-]
- 14c-1/34 . characterised by non-bladed rotor, e.g. with drilled holes (sirens 74d) [69-]
- 14c-1/36 . . using fluid friction [69-]

14c-3/00 Machines or engines with axial-thrust balancing effected by working fluid [69-]

- 14c-3/02 . characterised by having one fluid flow in one axial direction and another fluid flow in the opposite direction [69-]
- 14c-3/04 . axial thrust being compensated by thrust-balancing dummy piston or the like [69-]

14c-5/00 Blades; Blade-carrying members (nozzle boxes 14c-9/02); Heating, heat-insulating, cooling, or anti-vibration means on the blades or the members [69-]

- 14c-5/02 . Blade-carrying members, e.g. rotors (rotors of non-bladed type 14c-1/34; stators 14c-9/00) [69-]
- 14c-5/04 . . for radial-flow machines or engines [69-]
- 14c-5/06 . . Rotors for more than one axial stage, e.g. of drum or multiple-disc type; Details thereof, e.g. shafts, shaft connections [69-]
- 14c-5/08 . . Heating, heat-insulating, or cooling means [69-]

14c-5/10	. . Antivibration means	[69-]
14c-5/12	. Blades (blade roots 14c-5/30; rotors with blades adjustable in operation 14c-7/00; stator blades 14c-9/02)	[69-]
14c-5/14	. . Form or construction (selecting particular materials, measures against erosion or corrosion 14c-5/28)	[69-]
14c-5/16	. . . for counteracting blade vibration	[69-]
14c-5/18	. . . Hollow blades; Heating, heat-insulating, or cooling means on blades	[69-]
14c-5/20	. . . Specially-shaped blade tips to seal space between tips and stator	[69-]
14c-5/22	. . Blade-to-blade connections, e.g. by shrouding	[69-]
14c-5/24	. . . using wire or the like	[69-]
14c-5/26	. . Anti-vibration means not restricted to blade form or construction or to blade-to-blade connections	[69-]
14c-5/28	. . Selecting particular materials; Measures against erosion or corrosion	[69-]
14c-5/30	. Fixing blades to rotors; Blade roots	[69-]
14c-5/32	. . Locking, e.g. by final locking-blades or keys	[69-]
14c-5/34	. Rotor-blade aggregates of unitary construction	[69-]
14c-7/00	Rotors with blades adjustable in operation; Control thereof (for reversing 14c-1/30)	[69-]
14c-7/02	. having adjustment responsive to speed	[69-]
14c-9/00	Stators (non-fluid guiding aspects of casings, regulating, controlling, or safety aspects, see the relevant groups)	[69-]
14c-9/02	. Nozzles; Nozzle boxes; Stator blades; Guide conduits	[69-]
14c-9/04	. . forming ring or sector	[69-]
14c-9/06	. Fluid supply conduits to nozzles or the like	[69-]
14c-11/00	Preventing or minimising internal leakage of working fluid, e.g. between stages (sealings in general 47f2)	[69-]
14c-11/02	. by non-contact sealings, e.g. of labyrinth type (for sealing space between rotor blade tips and stator 14c-11/08)	[69-]
14c-11/04	. . using sealing fluid, e.g. steam	[69-]
14c-11/06	. . . Control thereof	[69-]
14c-11/08	. for sealing space between rotor blade tips and stator (specially-shaped blade tips therefor 14c-5/20)	[69-]
14c-11/10	. . using sealing fluid, e.g. steam	[69-]
14c-13/00	Combinations of two or more machines or engines (14c-15/00 takes precedence; regulating or controlling, see the relevant groups; combinations of two or more pumps 27c; fluid gearing 47h)	[69-]
14c-13/02	. Working-fluid interconnection of machines or engines	[69-]
14c-15/00	Adaptations of machines or engines for special use; Combinations of engines with devices driven thereby (regulating or controlling, see the relevant groups; aspects predominantly concerning driven devices, see the relevant classes for the devices)	[69-]
14c-15/02	. Adaptations for driving vehicles, e.g. locomotives (arrangement in vehicles, see the relevant vehicle classes)	[69-]
14c-15/04	. . the vehicles being waterborne vessels	[69-]
14c-15/06	. Adaptations for driving, or combinations with, hand-held tools or the like	[69-]
14c-15/08	. Adaptations for driving, or combinations with, pumps	[69-]
14c-15/10	. Adaptations for driving, or combinations with, electric generators	[69-]
14c-15/12	. Combinations with mechanical gearing (driven by multiple engines 14c-13/00)	[69-]
14c-17/00	Regulating or controlling by varying flow (for reversing 14c-1/30; by varying rotor blade position 14c-7/00; specially for starting 14c-19/00; shutting-down 14c-21/00; regulating or controlling in general 42r)	[69-]
14c-17/02	. Sensing elements	[69-]
14c-17/04	. . responsive to load	[69-]
14c-17/06	. . responsive to speed	[69-]
14c-17/08	. . responsive to condition of working fluid, e.g. pressure	[69-]
14c-17/10	. Final actuators	[69-]

14c-17/12	. . arranged in stator parts	[69-]
14c-17/14	. . . varying effective cross-sectional area of nozzles or guide conduits	[69-]
14c-17/16	. . . . by means of nozzle vanes	[69-]
14c-17/18	. . . varying effective number of nozzles or guide conduits	[69-]
14c-17/20	. Devices dealing with sensing elements or final actuators or transmitting means between them, e.g. power-assisted (sensing elements alone 14c-17/02; final actuators alone 14c-17/10)	[69-]
14c-17/22	. . the operation or power assistance being predominantly non-mechanical	[69-]
14c-17/24	. . . electrical	[69-]
14c-17/26	. . . fluid, e.g. hydraulic	[69-]
14c-19/00	Starting of machines or engines; Regulating, controlling, or safety means in connection therewith (warming-up before starting 14c-25/10; turning or inching gear 14c-25/34)	[69-]
14c-19/02	. dependent on temperature of component parts, e.g. of turbine casing	[69-]
14c-21/00	Shutting-down of machines or engines, e.g. in emergency; Regulating, controlling, or safety means not otherwise provided for	[69-]
14c-21/02	. Shutting-down responsive to overspeed	[69-]
14c-21/04	. responsive to undesired position of rotor relative to stator, e.g. indicating such position	[69-]
14c-21/06	. . Shutting-down	[69-]
14c-21/08	. . Restoring position	[69-]
14c-21/10	. responsive to unwanted deposits on blades, in working-fluid conduits, or the like	[69-]
14c-21/12	. responsive to temperature	[69-]
14c-21/14	. responsive to other specific conditions	[69-]
14c-21/16	. Trip gear	[69-]
14c-21/18	. . involving hydraulic means	[69-]
14c-21/20	. Checking operation of shut-down devices	[69-]
14c-23/00	Non-positive-displacement machines or engines with movement other than pure rotation, e.g. of endless-chain type	[69-]
14c-25/00	Component parts, details, or accessories, not provided for in, or of interest apart from, other groups	[69-]
14c-25/02	. De-icing means for engines having icing phenomena	[69-]
14c-25/04	. Antivibration arrangements	[69-]
14c-25/06	. . for preventing blade vibration (means on blade-carrying members or blades 14c-5/00)	[69-]
14c-25/08	. Cooling (of machines or engines in general 14i); Heating; Heat insulation (of blade-carrying members, of blades 14c-5/00)	[69-]
14c-25/10	. . Heating, e.g. warming-up before starting	[69-]
14c-25/12	. . Cooling	[69-]
14c-25/14	. . Casings modified therefor (double casings 14c-25/26)	[69-]
14c-25/16	. Bearings arrangement or adaptations (bearings per se 47b)	[69-]
14c-25/18	. Lubricating arrangements (of machines or engines in general 14i)	[69-]
14c-25/20	. . using lubrication pumps	[69-]
14c-25/22	. . using working fluid or other gaseous fluid as lubricant	[69-]
14c-25/24	. Casings (modified for heating or cooling 14c-25/14); Casing parts, e.g. diaphragms, casing fastenings (casings for rotary machines or engines in general 47a2)	[69-]
14c-25/26	. . Double casings; Measures against temperature strain in casings	[69-]
14c-25/28	. Supporting or mounting arrangements, e.g. for turbine casing	[69-]
14c-25/30	. Exhaust heads, chambers, or the like	[69-]
14c-25/32	. Collecting of condensation water; Drainage	[69-]
14c-25/34	. Turning or inching gear	[69-]
14c-25/36	. . using electric motors	[69-]

14d **Glidslidregleringar för ångmaskiner med fram-och-återgående kolvar, t.ex. planslidor eller kolvslidor** (slidkonstruktioner 47g) **[-69]**

Glidslider **[-69]**
14d-1 Musselslidor (46b1-16; 47g-26; 47g-29) **[-69]**

14d-2	Släpslider	[69]
14d-3	Slider med expansionsslid	[69]
14d-4	Meyerslider	[69]
14d-5	Riderslider	[69]
14d-6	Slider försedda med ventiler eller andra regleringsorgan	[69]
14d-7	Kolvslider (46b1-18; 47g-28)	[69]
14d-8	Rörslider	[69]
14d-9	Slider rörliga i både längdriktning och tvärriktning	[69]
14d-10	Dubbelslider; Speciella slidkonstruktioner	[69]
14d-11	Slidavlastning (47g-34); Detaljer till slidregleringar	[69]

Reglering eller omkastning av rörelsen hos glidslider; Regleranordningar för svänghjulslösa maskiner (46d; 87b-2) [69]

14d-12	Drivanordningar för reglerorgan med eller utan expansion; Anordningar för central drivning av reglerorgan (46b1)	[69]
14d-13	Reglering med hjälp av kolven eller kolvstången	[69]
14d-14	Rörelse av sliden enbart med hjälp av ånga, med eller utan särskilda reglerkolvar	[69]
14d-15	Reglering med förinställning med hjälp av ånga	[69]
14d-16	Reglering med förinställning med hjälp av kolvstången	[69]
14d-17	Rörelse av sliden genom anslag av kolven	[69]
14d-18	Rörelse av sliden genom påverkan från kolvstången	[69]
14d-19	Rörelse av sliden genom påverkan från kolvstången vid variabel fyllningsgrad	[69]
14d-20	Omkastning genom ombyte av inlopp och utlopp (46b1-21)	[69]
14d-21	Omkastning eller ändring av fyllningsgraden genom excenteromställning	[69]
14d-22	Omkastning eller ändring av fyllningsgraden genom kuliss anordningar eller länkanordningar	[69]
14d-23	Omkastningsanordningar, t.ex. pådragsanordningar eller stångsystem (46b1-21)	[69]
14d-24	Kataraktreglering	[69]
14d-25	Hydraulisk reglering	[69]
14d-26	Detaljer till slidregleringar	[69]

14d (IPC: F01L) Cyclically operating valves for machines or engines (valves in general 47g1) [69-]

Valve-gear for internal-combustion piston engines or for other machines or engines with positive working-fluid displacement (valve-gear specially for steam engines or specially for other machines or engines with variable fluid distribution 14d-15/00 to 14d-35/00) [69-]

14d-1/00	Valve-gear or valve arrangements, e.g. lift-valve gear (lift valve and valve seat assemblies per se 14d-3/00; slide-valve gear 14d-5/00; actuated non-mechanically 14d-9/00; valve arrangements in working piston or piston-rod 14d-11/00; modifications of valve-gear to facilitate reversing, braking, starting, changing compression ratio, or other specific operations 14d-13/00)	[69-]
14d-1/02	. Valve drive (transmitting-gear between valve drive and valve 14d-1/12)	[69-]
14d-1/04	. . by means of cams, camshafts, cam discs, eccentrics, or the like (14d-1/10 takes precedence)	[69-]
14d-1/06	. . . the cams, or the like, rotating at a higher speed than that corresponding to the valve cycle, e.g. operating four-stroke engine valves directly from crankshaft	[69-]
14d-1/08	. . . Shape of cams	[69-]
14d-1/10	. . by means of crank-driven or eccentric-driven rods	[69-]
14d-1/12	. Transmitting-gear between valve drive and valve (simultaneously operating two or more valves 14d-1/26)	[69-]
14d-1/14	. . Tappets; Push-rods	[69-]
14d-1/16	. . . Silencing impact; Reducing wear	[69-]
14d-1/18	. . Rocking arms or levers	[69-]
14d-1/20	. Adjusting or compensating clearance	[69-]

14d-1/22	. . automatically, e.g. mechanically	[69-]
14d-1/24	. . . by fluid means, e.g. hydraulically	[69-]
14d-1/26	. characterised by the provision of two or more valves operated simultaneously by same transmitting-gear; peculiar to machines or engines with more than two lift valves per cylinder (with coaxial valves 14d-1/28)	[69-]
14d-1/28	. characterised by the provision of coaxial valves; characterised by the provision of valves co-operating with both intake and exhaust ports	[69-]
14d-1/30	. characterised by the provision of positively opened and closed valves, i.e. desmodromic valves	[69-]
14d-1/32	. characterised by the provision of means for rotating lift valves, e.g. to diminish wear	[69-]
14d-1/34	. characterised by the provision of means for changing the timing of the valves without changing the duration of opening	[69-]
14d-1/36	. peculiar to machines or engines of specific type other than four-stroke cycle	[69-]
14d-1/38	. . for engines with other than four-stroke cycle, e.g. with two-stroke cycle (14d-1/26, 14d-1/28 take precedence)	[69-]
14d-1/40	. . for engines with scavenging charge near top dead-centre position, e.g. by overlapping inlet and exhaust time (scavenging aspects 46a)	[69-]
14d-1/42	. . for machines or engines characterised by cylinder arrangement, e.g. star or fan	[69-]
14d-1/44	. Multiple-valve gear or arrangements, not provided for in preceding subgroups, e.g. with lift and different valves	[69-]
14d-1/46	. Component parts, details, or accessories, not provided for in preceding subgroups	[69-]
14d-3/00	Lift valves, i.e. cut-off apparatus with closure members having at least a component of their opening and closing motion perpendicular to the closing faces; Parts or accessories thereof	[69-]
14d-3/02	. Selecting particular materials for valve members or valve seats; Valve members or valve seats composed of two or more materials	[69-]
14d-3/04	. . Coated valve members or valve seats	[69-]
14d-3/06	. Valve members or valve seats with means for guiding or deflecting the medium controlled thereby, e.g. producing a rotary motion of the drawn-in cylinder charge (for rotating lift valves 14d-1/32)	[69-]
14d-3/08	. Valve guides; Sealing of valve stem, e.g. sealing by lubricant	[69-]
14d-3/10	. Connecting springs to valve members	[69-]
14d-3/12	. Cooling of valves	[69-]
14d-3/14	. . by means of a liquid or solid coolant, e.g. sodium, in a closed chamber in a valve	[69-]
14d-3/16	. . by means of a fluid flowing through or along valve, e.g. air (for sealing only 14d-3/08)	[69-]
14d-3/18	. . . Liquid cooling of valve	[69-]
14d-3/20	. Shapes or constructions of valve members, not provided for in preceding subgroups of this group	[69-]
14d-3/22	. Valve seats not provided for in preceding subgroups of this group; Fixing of valve seats	[69-]
14d-3/24	. Safety means or accessories, not provided for in preceding subgroups of this group	[69-]
14d-5/00	Slide-valve gear or valve arrangements (with pure rotary or oscillatory movement 14d-7/00)	[69-]
14d-5/02	. with other than cylindrical, sleeve, or part-annularly-shaped valves, e.g. with flat-type valves	[69-]
14d-5/04	. with cylindrical, sleeve, or part-annularly-shaped valves	[69-]
14d-5/06	. . surrounding working cylinder or piston	[69-]
14d-5/08	. . . Arrangements with several movements or several valves, e.g. one valve inside the other (with part-annularly-shaped valves 14d-5/12)	[69-]
14d-5/10	. . . . with reciprocating and other movement of same valve	[69-]
14d-5/12	. . . Arrangements with part-annularly-shaped valves	[69-]
14d-5/14	. characterised by the provision of valves with reciprocating and other movements (surrounding working cylinder or piston 14d-5/06)	[69-]

14d-5/16	. . with reciprocating and other movement of same valve, e.g. longitudinally and in cross direction of working cylinder	[69-]
14d-5/18	. . with reciprocatory valve and other slide valve	[69-]
14d-5/20	. specially for two-stroke engines (14d-5/06 and 14d-5/14 take precedence)	[69-]
14d-5/22	. Multiple-valve arrangements (with valves surrounding working cylinder or piston 14d-5/06; with reciprocatory and other slide valves 14d-5/18; specially for two-stroke engines 14d-5/20)	[69-]
14d-5/24	. Component parts, details, or accessories, not provided for in preceding subgroups of this group	[69-]
14d-7/00	Rotary or oscillatory slide-valve gear or valve arrangements (slide valves with combined rotary and non-rotary movements, combinations of rotary and non-rotary slide valves 14d-5/00)	[69-]
14d-7/02	. with cylindrical, sleeve, or part-annularly-shaped valves (of disc type 14d-7/06; of conical type 14d-7/08)	[69-]
14d-7/04	. . surrounding working cylinder or piston	[69-]
14d-7/06	. with disc-type valves	[69-]
14d-7/08	. with conically- or frusto-conically-shaped valves	[69-]
14d-7/10	. with valves of other specific shape, e.g. spherical	[69-]
14d-7/12	. specially for two-stroke engines (14d-7/04 takes precedence)	[69-]
14d-7/14	. Multiple-valve arrangements (with valves surrounding working cylinder or piston 14d-7/04; specially for two-stroke engines 14d-7/12)	[69-]
14d-7/16	. Sealing or packing arrangements specially therefor	[69-]
14d-7/18	. Component parts, details, or accessories, not provided for in preceding subgroups of this group	[69-]
14d-9/00	Valve-gear or valve arrangements actuated non-mechanically	[69-]
14d-9/02	. by fluid means, e.g. hydraulic	[69-]
14d-9/04	. by electric means	[69-]
14d-11/00	Valve arrangements in working piston or piston-rod	[69-]
14d-11/02	. in piston	[69-]
14d-11/04	. . operated by movement of connecting-rod	[69-]
14d-11/06	. . . operating oscillatory valve	[69-]
14d-13/00	Modifications of valve-gear to facilitate reversing, braking, starting, changing compression ratio, or other specific operations	[69-]
14d-13/02	. for reversing	[69-]
14d-13/04	. for starting by means of fluid pressure	[69-]
14d-13/06	. for braking	[69-]
14d-13/08	. for decompression, e.g. during starting; for changing compression ratio	[69-]

Valve-gear or valve arrangements, e.g. with reciprocatory slide valves, specially for steam engines, or specially for other machines or engines with variable working-fluid distribution [69-]

Note: [69-]
The groups under this guide heading do not fully embrace subject-matter restricted to rotary, oscillatory, or valve-lift gear or valve arrangements, classified in groups 14d-33/00 and 14d-35/00. However, the present groups do embrace the following subject-matter thereof: valve drives or means external to valves for adjustment during operation, tripping-gear, reversing-gear, use of pistons or piston-rods as valves or as valve-supporting elements, valve-gear or valve arrangements peculiar to free-piston machines or engines. [69-]

- 14d-15/00** **Valve-gear or valve arrangements, e.g. with reciprocatory slide valves, other than provided for in groups 14d-17/00 to 14d-29/00** (valve drive or external valve-adjustment during operation, see the relevant groups, e.g. 14d-31/00; tripping-gear or tripping of valves 14d-31/00) [69-]
- 14d-15/02 . with valves other than cylindrical, sleeve, or part-annularly-shaped, e.g. flat D-valves [69-]
- 14d-15/04 . . main valve being combined with auxiliary valve (of drag-valve type 14d-15/10) [69-]
- 14d-15/06 . . . of Meyer or Rider type, i.e. in which the expansion is varied at the expansion valve itself [69-]
- 14d-15/08 . with cylindrical, sleeve, or part-annularly-shaped valves; Such main valves combined with auxiliary valves [69-]
- 14d-15/10 . with main slide valve and auxiliary valve dragged thereby [69-]
- 14d-15/12 . characterised by having means for effecting pressure equilibrium between two different cylinder spaces at idling [69-]
- 14d-15/14 . Arrangements with several co-operating main valves, e.g. reciprocatory and rotary [69-]
- 14d-15/16 . . with reciprocatory slide valves only [69-]
- 14d-15/18 . Valve arrangements not provided for in preceding subgroups of this main group [69-]
- 14d-15/20 . Component parts, details, or accessories, not provided for in preceding subgroups of this main group [69-]
- 14d-17/00** **Slide-valve gear or valve arrangements with cylindrical, sleeve, or part-annularly-shaped valves surrounding working cylinder or piston** [69-]
- 14d-17/02 . Drive, or adjustment during operation, peculiar thereto, e.g. for reciprocating and oscillating movements or for several valves one inside the other [69-]
- 14d-19/00** **Slide-valve gear or valve arrangements with reciprocatory and other movement of same valve, other than provided for in group 14d-17/00, e.g. longitudinally of working cylinder and in cross direction** [69-]
- 14d-19/02 . Drive, or adjustment during operation, peculiar thereto [69-]
- 14d-21/00** **Use of working pistons or piston-rods as fluid-distributing valves or as valve-supporting elements, e.g. in free-piston machines** [69-]
- 14d-21/02 . Piston or piston-rod used as valve member [69-]
- 14d-21/04 . Valves arranged in or on piston or piston-rod [69-]
- 14d-23/00** **Valves controlled by impact of piston, e.g. in free-piston machines** [69-]
- 14d-25/00** **Drive, or adjustment during operation, of distribution or expansion valves by non-mechanical means** [69-]
- 14d-25/02 . by fluid means [69-]
- 14d-25/04 . . by working fluid of machine or engine, e.g. free-piston machine [69-]
- 14d-25/06 . . . Arrangements with main and auxiliary valves, at least one of them being fluid-driven [69-]
- 14d-25/08 . by electric or magnetic means [69-]

14d-27/00	Distribution or expansion-valve gear peculiar to free-piston machines or engines and not provided for in groups 14d-21/00 to 14d-25/00	[69-]
14d-27/02	. the machine or engine having rotary or oscillatory valves	[69-]
14d-27/04	. Delayed-action controls, e.g. of cataract- or dash-pot-type	[69-]
14d-29/00	Reversing-gear (equally usable for control of degree of working fluid admission, and reversing being of secondary importance 14d-31/00)	[69-]
14d-29/02	. by displacing eccentric	[69-]
14d-29/04	. by links or guide rods	[69-]
14d-29/06	. by interchanging inlet and exhaust ports	[69-]
14d-29/08	. specially for rotary or oscillatory valves	[69-]
14d-29/10	. Details, e.g. drive	[69-]
14d-29/12	. . Powered reverse gear	[69-]
14d-31/00	Valve drive, valve adjustment during operation, or other valve control, not provided for in groups 14d-15/00 to 14d-29/00 (sensing elements measuring the variable or condition to be controlled or regulated 14a)	[69-]
14d-31/02	. with tripping-gear (for oscillatory valves 14d-31/06); Tripping of valves	[69-]
14d-31/04	. . with positively-driven trip levers	[69-]
14d-31/06	. with tripping-gear specially for oscillatory valves; Oscillatory tripping-valves, e.g. of Corliss type	[69-]
14d-31/08	. Valve drive or valve adjustment, apart from tripping aspects; Positively-driven gear	[69-]
14d-31/10	. . the drive being effected by eccentrics (14d-31/14 takes precedence)	[69-]
14d-31/12	. . . Valve adjustment by displacing eccentric	[69-]
14d-31/14	. . Valve adjustment by links or guide rods, e.g. in valve-gears with eccentric drive	[69-]
14d-31/16	. . the drive being effected by specific means other than eccentric, e.g. cams; Valve adjustment in connection with such drives	[69-]
14d-31/18	. . specially for rotary or oscillatory valves	[69-]
14d-31/20	. . . Valve adjustment	[69-]
14d-31/22	. . specially for lift valves	[69-]
14d-31/24	. . . Valve adjustment	[69-]
<u>Rotary or oscillatory slide-valve gear or lift-valve gear or such valve arrangements specially for steam engines or specially for other machines or engines with variable working-fluid distribution</u> (drive, adjustment during operation, tripping-gear, reversing-gear, use of working pistons or piston-rods as valves or as valve-supporting elements, valve-gear or valve arrangements peculiar to free-piston machines or engines 14d-15/00 to 14d-31/00)		
14d-33/00	Rotary or oscillatory slide-valve gear or valve arrangements	[69-]
14d-33/02	. rotary	[69-]
14d-33/04	. oscillatory	[69-]
14d-35/00	Lift-valve gear or valve arrangements	[69-]
14d-35/02	. Valves	[69-]
14d-35/04	. Arrangements of valves in the machine or engine, e.g. relative to working cylinder	[69-]
14e	Vridslidregleringar för ångmaskiner med fram-och-återgående kolvar, t.ex. rörlider, skivor och ventiler; Andra regleranordningar som inte omfattas av 14d eller 14f (ventilkonstruktioner 47g)	[-69]
14e-1	Corlissregleringar eller corlissventiler med utlösning	[-69]
14e-2	Tvångsstyrda corlissregleringar eller corlissventiler	[-69]
14e-3	Reglering med hjälp av svängande rundslider eller rörlider	[-69]
14e-4	Reglering med hjälp av roterande rundslider eller rörlider	[-69]
14e-5	Reglering med hjälp av svängande skivor	[-69]
14e-6	Reglering med hjälp av roterande skivor	[-69]
14e-7	Elektriskt drivna regleranordningar, t.ex. ventilregleringar	[-69]

14e-8	Inställningsanordningar	[-69]
14f	Ventilregleringar för ångmaskiner med fram-och-återgående kolvar (ventilkonstruktioner 47g; ventilregleringar för förbränningsmotorer 46b1; elektriskt drivna ventilregleringar 14e-7)	[-69]
14f-1	Ventilregleringar med utlösning i allmänhet	[-69]
14f-2	Ventilregleringar med utlösning med tvångsmässigt påverkad medbringare	[-69]
14f-3	Ventilregleringar med regleranordningar påverkade från en roterande axel	[-69]
14f-4	Tvångsstyrda ventilregleringar med variabelt stångsystem; Tvångsstyrda ventilregleringar med direkt drivning	[-69]
14f-5	Tvångsstyrda ventilregleringar drivna med hjälp av två excentrar; Kulissregleringar	[-69]
14f-6	Tvångsstyrda ventilregleringar med variabel drivning från en excenterpunkt	[-69]
	Ventilregleringar med nockdrivning	[-69]
14f-7/01	Påverkan med hjälp av formkroppar	[-69]
14f-7/02	Dubbel påverkan	[-69]
14f-7/03	Påverkan med hjälp av kurvskivor	[-69]
14f-7/04	Rörelseöverföring med länksystem	[-69]
14f-7/05	Lenzreglering	[-69]
14f-7/06	Nockreglering	[-69]
14f-7/07	Meyerreglering	[-69]
14f-7/08	Påverkan med hjälp av förskjutbara kurvkroppar	[-69]
14f-7/09	Rörelseöverföring med hjälp av svängbara kurvkroppar	[-69]
14f-7/10	Rörelseöverföring med hjälp av kurvstänger	[-69]
14f-8	Ventilreglering med tvångsstyrd stängningsrörelse eller öppningsrörelse med hjälp av lufttryck, ångtryck eller vätskestryck, t.ex. med vätskestångsystem	[-69]
14f-9	Buffertanordningar; Avlastningsanordningar; Detaljer till ventilregleringar	[-69]
14f-10	Ventilanordningar vid ångcylindrar eller ventilomkastningsanordningar	[-69]
14g	Tillbehör till ångmaskiner; Balanseringsanordningar för svänghjulslösa pumpar och kompressorer; Kondensorer i anslutning till ångmaskiner (17d)	[-69]
14g-1	Ånginströmningsventiler; Avloppsventiler (47g1)	[-69]
14g-2	Igångsättningsanordningar för compoundmaskiner	[-69]
	Regleranordningar för färskångdrift	[-69]
14g-3/01	Reglering av en maskin med flera regulatorer	[-69]
14g-3/02	Reglering av flera maskiner	[-69]
14g-3/03	Reglering av mottrycksmaskiner	[-69]
14g-3/04	Reglering av avtappningsmaskiner	[-69]
14g-3/05	Reglering av tvåtrycksmaskiner	[-69]
14g-3/00	Reglering av uppfordringsmaskiner eller valsverksmaskiner	[-69]
14g-3/07	Regleranordningar av andra slag	[-69]
14g-4	Regleranordningar för ångsamlarånga eller kondensorånga	[-69]
	Bromsanordningar; Säkerhetsanordningar	[-69]
14g-5/01	Bromsanordningar	[-69]
14g-5/02	Säkerhetsanordningar mot otillåtna varvtalsändringar, vid plötsliga ändringar i belastningen e.d.	[-69]
14g-5/03	Säkerhetsanordningar för förhindrande av drivning i felaktig rörelseriktning	[-69]
14g-5/04	Säkerhetsanordningar för förhindrande av vattenslag eller inkommande av vatten i ånganläggningar	[-69]
14g-5/05	Säkerhetsanordningar vid uppfordringsmaskiner (35a-22; 35a-23)	[-69]

14g-5/06	Säkerhetsanordningar vid arbetsmaskiner drivna med hjälp av två kraftmaskiner (14c-14; 17d-5/17)	[-69]
14g-5/07	Säkerhetsanordningar vid ångmaskinsdrivna generatorer	[-69]
14g-5/08	Provning av säkringsanordningar i drift (14c-8/06)	[-69]
14g-5/09	Vacuumbrytare	[-69]
14g-5/10	Säkerhetsanordningar vid icke-fungerande regulatorer e.d.	[-69]
14g-5/11	Säkerhetsanordningar vid med hjälpregleranordningar påverkade ventiler	[-69]
14g-5/12	Säkerhetsanordningar av andra slag	[-69]
14g-6	Uppvärmning; Kylning; Värmeisolering	[-69]
14g-7	Smörjning (smörjningsanordningar i allmänhet 47e-7 – 47e-30)	[-69]
14g-8	Oljeavskiljare (13d-30)	[-69]
14g-9/01	Mätanordningar	[-69]
14g-9/02	Igångsättningsanordningar	[-69]
14g-9/03	Anordningar för påverkande av cylinderkompressionen	[-69]
14g-10	Ventilatorer; Ljuddämpare (46c6-1; 46c6-2; 47f-1/01; 72a-28)	[-69]
14g-11	Balanseringsanordningar för svänghjulslösa maskiner	[-69]
14g-12	Kondensoranordningar som påverkar maskinens funktion (i allmänhet 12a-6; 14c-13; 17d; 20b-14; 89e)	[-69]
14g-13	Kondensatpumpar (i allmänhet 27b, 27c, 27d)	[-69]
14g-14	Vattenavskiljning ur ångcylindrar	[-69]
14g-15	Tomgångsanordningar vid ångmaskiner, t.ex. tomgångsventiler, överströmningsventiler, tomgångsslider eller lösbara kopplingar mellan kolvar och vevstakar	[-69]
14g-16	Avstängningsorgan (47g)	[-69]
14h	Speciella anordningar för utnyttjande av ångkraft; Av ångpannor oberoende ångackumulatörer	[-69]
	Återföring av avloppsånga från ångmaskin till ångpanna; Speciella ångkraftanläggningar (13h-25)	[-69]
14h-1/01	Kylning av avloppsånga	[-69]
14h-1/02	Kylning av ångan i cylindern	[-69]
14h-1/03	Överhettning av avloppsånga	[-69]
14h-1/04	Avskiljande av avloppsånga	[-69]
14h-1/05	Cirkulerande ånga med överhettning	[-69]
14h-1/06	Cirkulerande ånga med avkylning, komprimering och överhettning	[-69]
14h-1/07	Avloppsångregenerering genom komprimering	[-69]
14h-1/08	Avloppsångregenerering med hjälp av strålpump	[-69]
14h-1/09	Återföring av kondensat till ångpannan	[-69]
14h-1/10	Ångkraftanläggningar med Honigmannförfarande	[-69]
14h-1/11	Uppdelning av en anläggning i olika trycksteg; Tvåtryckanläggningar	[-69]
14h-1/12	Högtrycksånganläggningar; Gränsånganläggningar	[-69]
14h-1/13	Allmän utformning av hela ångkraftverk	[-69]
14h-1/14	Speciella ångkraftanläggningar	[-69]
14h-2	Avtappning av ånga från ångmaskiner för andra ändamål, t.ex. uppvärmning, torkning eller kokning (14c-13)	[-69]
14h-3/01	Rena vätskevärmeackumulatörer eller anläggningar med sådana; Energiminskning hos hett vatten i expansionskärl med ångutveckling för drivning av kraftmaskiner (13g-3/05)	[-69]
14h-3/02	Rena ångackumulatörer; Anläggningar med sådana	[-69]
14h-3/03	Ångackumulatörer med ångackumulering i vätska; Byggnad eller allmänna anordningar vid sådana	[-69]
14h-3/04	Laddningsanordningar eller urladdningsanordningar vid värmeackumulatörer	[-69]

14h-3/05	Hopkoppling av flera ackumulatorer; Laddning, urladdning eller reglering av hopkopplade ackumulatorer	[69-]
14h-3/06	Ventiler, mätanordningar, säkerhetsanordningar eller regleranordningar vid värmeackumulatorer	[69-]
14h-3/07	Kraftanläggningar med ackumulator; Tvåtrycksmaskiner (14c-17)	[69-]
14h-3/08	Ackumulering av överhettningvärme; Ackumulatorer utan ånginledning; Värmeväxlare	[69-]
14h-3/09	Ångkraftanläggningar med parallellt kopplade ackumulatorer	[69-]
14h-3/10	Ångkraftanläggningar med mellankopplade ackumulatorer	[69-]
14h-3/11	Ackumulatorer med andra ackumulatormassor än vatten	[69-]
14h-3/12	Tillgodogörande av avloppsånga eller avloppsvärme (14a-19; 14c-13, 17; 24d-7; 46c6-4; 46c6-5; 46d-14; 46f-5)	[69-]
14h-3/13	Överhettning av ackumulatorånga; Överhettarackumulatorer	[69-]
14h-3/14	Allmänna kraftutjämningsanordningar; Värmeutjämningsanordningar utan ackumulator	[69-]
14h-3/15	Användning av ackumulatorer till andra ändamål	[69-]
14h-4/01	Mellanöverhettning; Direkt ånguppvärmning (mellanöverhettare 13d)	[69-]
14h-4/02	Reglering av överhettningstemperaturen	[69-]
14h-4/03	Ångbildning i cylindern	[69-]
14h-5	Drivning av kraftmaskiner med hjälp av hett vatten; Drivning av kraftmaskiner med hjälp av blandningar av ånga och vatten, blandningar av ånga och luft eller luft och ånga, blandade eller var för sig; Anordningar för framställning av drivmediet	[53-]
14h-5	Drivning av kraftmaskiner med hjälp av hett vatten; Drivning av kraftmaskiner med hjälp av blandningar av ånga och vatten; Anordningar för framställning av drivmediet	[53-]
14h-6	Kallångmaskiner drivna med ammoniakångor, kolsyraångor, eterångor eller liknande ångor som kraftmaskiner; Anordningar för framställning av kallånga (som kylmaskiner 17a; kondensorer för kallångmaskiner 17d-6)	[69-]
14h-7	Kraftmaskiner med andra drivmedier än vattenånga eller kallånga, t.ex. metallångor, bränsleångor eller genom kemiska processer framställda gaser eller ångor, om drivmediet verkar endast genom expansion; Anordningar för framställning av sådana drivmedier (46a3, 46a6)	[53-]
14h-7/01	Drivning av kraftmaskiner med kvicksilverånga; Kvicksilverångpannor	[53-]
14h-7/02	Kraftmaskiner drivna med andra medier i ångform än vattenånga eller kallånga, t.ex. bränsleångor, ångor av andra metaller än kvicksilver eller ångor framställda genom kemiska processer, om drivmediet verkar endast genom expansion; Anordningar för framställning av sådana drivmedier (46a3, 46a6)	[53-]
14h-8	Ackumulering eller omformning av värmeenergi i ångor utom vattenånga (ånggenerering ur lutar 13g)	[69-]
14h	(IPC: F01K) Steam engine plants; Steam accumulators; Engine plants not otherwise provided for; Engines using special working fluids or cycles (gas-turbine or jet-propulsion plants 46f, 46g; nuclear power plants, engine arrangements therein 21g-21)	[69-]
14h-1/00	Steam accumulators (use of accumulators in steam engine plants 14h-3/00)	[69-]
14h-1/02	. for storing steam otherwise than in a liquid	[69-]
14h-1/04	. for storing steam in a liquid, e.g. Ruth's type	[69-]
14h-1/06	. . Internal fittings facilitating steam distribution, steam formation, or circulation (acting during charging or discharging 14h-1/08; fittings facilitating circulation through multiple accumulators 14h-1/14)	[69-]
14h-1/08	. Charging or discharging of accumulators with steam (peculiar to multiple accumulators 14h-1/12)	[69-]
14h-1/10	. specially adapted for superheated steam	[69-]
14h-1/12	. Multiple accumulators; Charging, discharging, or regulating peculiar thereto	[69-]
14h-1/14	. . Circulation	[69-]

14h-1/16	. Other safety or regulating means	[69-]
14h-1/18	. . for steam pressure	[69-]
14h-1/20	. Other steam-accumulator parts, details, or accessories	[69-]
<u>Steam engine plants</u>		[69-]
14h-3/00	Plants characterised by the use of steam or heat accumulators, or intermediate steam heaters, therein (regenerating exhaust steam 14h-19/00)	[69-]
14h-3/02	. Use of accumulators and specific engine types; Regulating thereof	[69-]
14h-3/04	. . the engine being of multiple-inlet-pressure type	[69-]
14h-3/06	. . the engine being of extraction or non-condensing type	[69-]
14h-3/08	. Use of accumulators and the plant being specially adapted for a specific use	[69-]
14h-3/10	. . for vehicle drive, e.g. for accumulator locomotives	[69-]
14h-3/12	. having two or more accumulators	[69-]
14h-3/14	. having both steam accumulator and heater, e.g. superheating accumulator (superheating accumulators per se 14h-1/10)	[69-]
14h-3/16	. . Mutual arrangement of accumulator and heater	[69-]
14h-3/18	. having heaters (having both steam accumulator and heater 14h-3/14; steam heaters per se 13)	[69-]
14h-3/20	. . with heating by combustion gases of main boiler	[69-]
14h-3/22	. . . Controlling, e.g. starting or stopping	[69-]
14h-3/24	. . with heating by separately-fired heaters	[69-]
14h-3/26	. . with heating by steam	[69-]
14h-5/00	Plants characterised by use of means for storing steam in an alkali to increase steam pressure, e.g. of Honigmann or Koenemann type	[69-]
14h-5/02	. used in regenerative installation	[69-]
14h-7/00	Plants characterised by the use of specific types of engine (14h-3/02 takes precedence); Plants or engines characterised by their use of special steam systems, cycles, or processes (reciprocating-piston engines using uniflow principle 14a-17/04); Regulating means peculiar to such systems, cycles, or processes; Use of withdrawn or exhaust steam for feed-water heating	[69-]
14h-7/02	. the engines being of multiple-expansion type (the engines being only of turbine type 14h-7/16; the engines using steam of critical or over-critical pressure 14h-7/32; the engines being of extraction or non-condensing type 14h-7/34)	[69-]
14h-7/04	. . Regulating means peculiar thereto	[69-]
14h-7/06	. the engines being of multiple-inlet-pressure type (14h-7/02 takes precedence; the engines being only of turbine type 14h-7/16; the engines using steam of critical or over-critical pressure 14h-7/32; the engines being of extraction or non-condensing type 14h-7/34)	[69-]
14h-7/08	. . Regulating means peculiar thereto	[69-]
14h-7/10	. characterised by the engine exhaust pressure (the engines being only of turbine type 14h-7/16; the engines using steam of critical or over-critical pressure 14h-7/32; the engines being of extraction or non-condensing type 14h-7/34)	[69-]
14h-7/12	. . of condensing type	[69-]
14h-7/14	. . . Regulating means peculiar thereto	[69-]
14h-7/16	. the engines being only of turbine type (the engines using steam of critical or over-critical pressure 14h-7/32; the engines being of extraction or non-condensing type 14h-7/34)	[69-]
14h-7/18	. . the turbine being of multiple-inlet-pressure type	[69-]
14h-7/20	. . . Regulating means peculiar thereto	[69-]
14h-7/22	. . the turbines having inter-stage steam heating	[69-]
14h-7/24	. . . Regulating or safety means peculiar thereto	[69-]
14h-7/26	. . the turbines having inter-stage steam accumulation	[69-]
14h-7/28	. . . Regulating means peculiar thereto	[69-]
14h-7/30	. . the turbines using exhaust steam only	[69-]
14h-7/32	. the engines using steam of critical or over-critical pressure	[69-]

14h-7/34	. the engines being of extraction or non-condensing type; Use of steam for feed-water heating (feed-water heaters per se 13b)	[69-]
14h-7/36	. . the engines being of positive-displacement type	[69-]
14h-7/38	. . the engines being of turbine type	[69-]
14h-7/40	. . Use of two or more feed-water heaters in series	[69-]
14h-7/42	. . Use of desuperheaters for feed-water heating	[69-]
14h-7/44	. . Use of steam for feed-water heating and another purpose	[69-]
14h-9/00	Plants characterised by condensers arranged or modified to co-operate with the engines (by condensers structurally combined with engines	
	14h-11/00; steam condensers per se 17d)	[69-]
14h-9/02	. Arrangements or modifications of condensate or air pumps	[69-]
14h-9/04	. with dump valves to by-pass stages	[69-]
14h-11/00	Plants characterised by the engines being structurally combined with boilers or condensers	[69-]
14h-11/02	. the engines being turbines	[69-]
14h-11/04	. the boilers or condensers being rotated in use	[69-]
14h-13/00	General layout or general methods of operation, of complete plants	[69-]
14h-13/02	. Regulating, e.g. stopping or starting	[69-]
14h-15/00	Adaptations of plants for special use	[69-]
14h-15/02	. for driving vehicles, e.g. locomotives (arrangements in vehicles, see the relevant vehicle classes)	[69-]
14h-15/04	. . the vehicles being waterborne vessels	[69-]
14h-17/00	Using steam or condensate extracted or exhausted from steam engine plant (for heating feed-water 14h-7/34; returning condensate to boiler 13b)	[69-]
14h-17/02	. for heating purposes, e.g. industrial, domestic (14h-17/06 takes precedence;	[69-]
14h-17/04	. for specific purposes other than heating (14h-17/06 takes precedence)	[69-]
14h-17/06	. Returning energy of steam, in exchanged form, to process, e.g. use of exhaust steam for drying solid fuel of plant	[69-]
14h-19/00	Regenerating or otherwise treating steam exhausted from steam engine plant (plants characterised by use of means for storing steam in an alkali to increase steam pressure 14h-5/00; returning condensate to boiler 13b)	[69-]
14h-19/02	. Regenerating by compression	[69-]
14h-19/04	. . in combination with cooling or heating	[69-]
14h-19/06	. . in engine cylinder	[69-]
14h-19/08	. . compression done by injection apparatus, jet blower, or the like	[69-]
14h-19/10	. Cooling exhaust steam other than by condenser; Rendering exhaust steam invisible	[69-]
14h-21/00	Steam engine plants not otherwise provided for	[69-]
14h-21/02	. with steam generation in engine cylinders	[69-]
14h-21/04	. using mixtures of steam and gas; Plants generating or heating steam by bringing water or steam into direct contact with hot gas (direct-contact steam generators per se 13a)	[69-]
14h-21/06	. Treating live steam, other than thermodynamically, e.g. for fighting deposits in engine	[69-]
14h-23/00	Plants characterised by more than one engine delivering power external to the plant, the engines being driven by different fluids	[69-]
14h-23/02	. the engine cycles being thermally coupled	[69-]
14h-23/04	. . condensation heat from one cycle heating the fluid in another cycle	[69-]
14h-23/06	. . combustion heat from one cycle heating the fluid in another cycle	[69-]
14h-23/08	. . . with working fluid of one cycle heating the fluid in another cycle	[69-]
14h-23/10	. . . with exhaust fluid of one cycle heating the fluid in another cycle	[69-]
14h-23/12	. the engines being mechanically coupled (14h-23/02 takes precedence)	[69-]
14h-23/14	. . including at least one combustion engine	[69-]
14h-23/16	. . all the engines being turbines (14h-23/14 takes precedence)	[69-]

14h-23/18	. characterised by adaptation for specific use	[69-]
14h-25/00	Plants or engines characterised by use of special working fluids, not otherwise provided for; Plants operating enclosed cycles and not otherwise provided for	[69-]
14h-25/02	. the fluid remaining in the liquid phase	[69-]
14h-25/04	. the fluid being in different phases, e.g. foamed	[69-]
14h-25/06	. using mixtures of different fluids (plants using mixtures of steam and gas 14h-21/04)	[69-]
14h-25/08	. using special vapours	[69-]
14h-25/10	. . the vapours being cold, e.g. ammonia, carbon dioxide, ether	[69-]
14h-25/12	. . the vapours being metallic, e.g. mercury	[69-]
14h-25/14	. . using industrial or other waste gases	[69-]
14h-27/00	Plants for converting heat or fluid energy into mechanical energy, not otherwise provided for	[69-]
14h-27/02	. Plants modified to use their waste heat, other than that of exhaust, e.g. engine-friction heat	[69-]
14i	(IPC: F01M) Lubricating of machines or engines in general (lubricating in general 47e); Lubricating internal-combustion engines	[69-]
14i-1/00	Pressure lubrication	[69-]
14i-1/02	. using lubricating pumps (pumps in general 59; lubricating pumps per se 47e)	[69-]
14i-1/04	. using pressure in working cylinder or crankcase to operate lubricant-feeding devices	[69-]
14i-1/06	. Lubricating systems characterised by the provision therein of crankshafts or connecting-rods with lubricant passageways, e.g. bores (crankshafts, connecting-rods, per se 47b)	[69-]
14i-1/08	. Lubricating systems characterised by the provision therein of lubricant-jetting means	[69-]
14i-1/10	. Lubricating systems characterised by the provision therein of lubricant venting or purifying means, e.g. of filters	[69-]
14i-1/12	. Closed-circuit lubricating systems not provided for in groups 14i-1/02 to 14i-1/10	[69-]
14i-1/14	. Timed lubrication (14i-1/08 takes precedence)	[69-]
14i-1/16	. Controlling lubricant pressure or quantity (rendering machines or engines inoperative or idling on lubricant-pressure failure 14i-1/22)	[69-]
14i-1/18	. Indicating or safety devices (concerning lubricant level 14i-11/06, 14i-11/12)	[69-]
14i-1/20	. . concerning lubricant pressure	[69-]
14i-1/22	. . . rendering machines or engines inoperative or idling on pressure failure	[69-]
14i-1/24	. . . . acting on engine fuel system	[69-]
14i-1/26	. . . . acting on engine ignition system	[69-]
14i-1/28	. . . . acting on engine combustion-air supply	[69-]
14i-3/00	Lubrication specially adapted for engines with crankcase compression of fuel-air mixture, or for other engines in which lubricant is contained in fuel, combustion air, or fuel-air mixture (separating lubricant from air or fuel-air mixture before entry into cylinder 14i-11/08)	[69-]
14i-3/02	. with variable proportion of lubricant to fuel, lubricant to air, or lubricant to fuel-air mixture	[69-]
14i-3/04	. for upper cylinder lubrication only	[69-]
14i-5/00	Heating, cooling, or controlling temperature of lubricant (arrangement of lubricant coolers in engine cooling system 14i-11/08); Lubrication means facilitating engine starting	[69-]
14i-5/02	. Conditioning lubricant for aiding engine starting, e.g. heating	[69-]
14i-5/04	. . Diluting, e.g. with fuel	[69-]
14i-7/00	Lubrication means specially adapted for machine or engine running-in	[69-]

14i-9/00	Lubrication means having pertinent characteristics not provided for in, or of interest apart from, groups 14i-1/00 to 14i-7/00	[69-]
14i-9/02	. having means for introducing additives to lubricant	[69-]
14i-9/04	. Use of fuel as lubricant	[69-]
14i-9/06	. Dip or splash lubrication	[69-]
14i-9/08	. Drip lubrication	[69-]
14i-9/10	. Lubrication of valve gear or auxiliaries	[69-]
14i-9/12	. Non-pressurised lubrication, or non-closed-circuit lubrication, not otherwise provided for	[69-]
14i-11/00	Component parts, details, or accessories, not provided for in, or of interest apart from, groups 14i-1/00 to 14i-9/00	[69-]
14i-11/02	. Arrangements of lubricant conduits	[69-]
14i-11/04	. Filling or draining lubricant of or from machines or engines	[69-]
14i-11/06	. Means for keeping lubricant level constant or for accommodating movement or position of machines or engines	[69-]
14i-11/08	. Separating lubricant from air or fuel-air mixture before entry into cylinder (separating in general 26d)	[69-]
14i-11/10	. Indicating devices; Other safety devices	[69-]
14i-11/12	. . concerning lubricant level	[69-]
14k	(IPC: F01N) Gas-flow silencers or exhaust apparatus for machines or engines in general; Gas-flow silencers or exhaust apparatus for internal combustion engines (combustion-air intake silencers specially adapted for, or arranged on, internal-combustion engines 46c-35/00; protecting against, or damping, noise in general 42g-1/10)	[69-]
14k-1/00	Silencing apparatus characterised by method of silencing	[69-]
14k-1/02	. by using resonance	[69-]
14k-1/04	. . having sound-absorbing materials in resonance chambers	[69-]
14k-1/06	. by using interference effect	[69-]
14k-1/08	. by reducing exhaust energy by throttling or whirling	[69-]
14k-1/10	. . in combination with sound-absorbing materials	[69-]
14k-1/12	. . using spirally- or helically-shaped channels (14k-1/10 takes precedence; cyclones 50e-3/10)	[69-]
14k-1/14	. by adding air to exhaust gases	[69-]
14k-1/16	. by using movable parts	[69-]
14k-1/18	. . having rotary movement	[69-]
14k-1/20	. . having oscillating or vibrating movement (the parts being resilient walls 14k-1/22)	[69-]
14k-1/22	. . the parts being resilient walls	[69-]
14k-1/24	. by using sound-absorbing materials (14k-1/04, 14k-1/06, 14k-1/10, 14k-1/14, 14k-1/16 take precedence)	[69-]
14k-3/00	Exhaust or silencing apparatus having means for purifying, rendering innocuous, or otherwise treating exhaust	[69-]
14k-3/02	. for cooling, or for removing solid constituents of, exhaust	[69-]
14k-3/04	. . using liquids	[69-]
14k-3/06	. for extinguishing sparks	[69-]
14k-3/08	. for rendering innocuous	[69-]
14k-3/10	. . by burning, e.g. by after-burning using additional air	[69-]
14k-3/12	. . . adding fuel (14k-3/14 takes precedence)	[69-]
14k-3/14	. . . having igniting means, e.g. catalysts	[69-]
14k-3/16	. . by other chemical processes	[69-]

14k-5/00	Exhaust or silencing apparatus combined or associated with devices profiting by exhaust energy (predominant aspects of such devices, see the relevant classes for the devices; using kinetic or wave energy of exhaust gases in exhaust systems for charging 46a)	[69-]
14k-5/02	. the devices using heat	[69-]
14k-5/04	. the devices using kinetic energy	[69-]
14k-7/00	Exhaust or silencing apparatus, or parts thereof, having pertinent characteristics not provided for in, or of interest apart from, groups 14k-1/00 to 14k-5/00	[69-]
14k-7/02	. Apparatus having two or more separate silencers in series	[69-]
14k-7/04	. Apparatus having two or more silencers in parallel for multi-cylinder engines, e.g. having interconnections	[69-]
14k-7/06	. specially adapted for star-arrangement of cylinders, e.g. exhaust manifolds	[69-]
14k-7/08	. Other arrangements or adaptations of exhaust conduits (pipes in general 47f1)	[69-]
14k-7/10	. . of exhaust manifolds	[69-]
14k-7/12	. specially adapted for submerged exhausting	[69-]
14k-7/14	. having thermal insulation	[69-]
14k-7/16	. Selection of particular materials	[69-]
14k-7/18	. Construction facilitating manufacture, assembly, or disassembly	[69-]
14k-7/20	. Flared outlets, e.g. of fish-tail shape	[69-]
14I	(IPC: F01P) Cooling of machines or engines in general (lubricating in general 47e); Cooling of internal-combustion engines (heat exchange in general, radiators 17e, 17f)	[69-]

Notes: **[69-]**

1. Cooling by lubricant is classified in subclass 14i when the lubrication aspect predominates, and in subclass 14I when the cooling aspect predominates. **[69-]**

2. In this subclass: The following terms are used with the meanings indicated:

(a) "Air" includes other gaseous cooling fluids.

(b) "Liquid cooling" also embraces cooling where liquid is used as the heat-transferring fluid between parts to be cooled and the air, e.g. using radiators.

(c) "Air cooling" means direct air cooling and thus excludes indirect air cooling occurring in liquid cooling systems as explained under (b).

(d) "Cooling-air" embraces directly- or indirectly-acting cooling-air. **[69-]**

Air cooling; Liquid cooling (propelling cooling-air or liquid coolants 14I-5/00; controlling supply or circulation of coolants 14I-7/00; cylinders, pistons, valves, fuel injectors, sparking-plugs, or other engine or machine parts per se, modified to facilitate cooling, see the relevant classes for such parts) **[69-]**

14I-1/00	Air cooling	[69-]
14I-1/02	. Arrangements for cooling cylinders or cylinder heads, e.g. ducting cooling-air from its pressure source to cylinders or along cylinders	[69-]
14I-1/04	. Arrangements for cooling pistons	[69-]
14I-1/06	. Arrangements for cooling other engine or machine parts	[69-]
14I-1/08	. . for cooling intake or exhaust valves	[69-]
14I-1/10	. . for cooling fuel injectors or sparking-plugs	[69-]
14I-3/00	Liquid cooling	[69-]
14I-3/02	. Arrangements for cooling cylinders or cylinder heads	[69-]
14I-3/04	. . Liquid-to-air heat-exchangers combined with, or arranged on, cylinders or cylinder heads	[69-]
14I-3/06	. Arrangements for cooling pistons	[69-]
14I-3/08	. . Cooling of piston exterior only, e.g. by jets	[69-]
14I-3/10	. . Cooling by flow of coolant through pistons	[69-]

14I-3/12	. Arrangements for cooling other engine or machine parts	[69-]
14I-3/14	. . for cooling intake or exhaust valves	[69-]
14I-3/16	. . for cooling fuel injectors or sparking-plugs	[69-]
14I-3/18	. Arrangement or mounting of liquid-to-air heat-exchangers (such arrangements on cylinders or cylinder heads 14I-3/04; relative to vehicles 63c-72)	[69-]
14I-3/20	. Cooling circuits not specific to a single part of engine or machine (14I-3/22 takes precedence)	[69-]
14I-3/22	. characterised by evaporation and condensation of coolant in closed cycles (other cooling by evaporation 14I-9/02); characterised by the coolant reaching higher temperatures than normal atmospheric boiling-point	[69-]

Pumping cooling-air or liquid coolants; Controlling circulation or supply of coolants [69-]

14I-5/00 Pumping cooling-air or liquid coolants (controlling circulation or supply of coolants by influencing drive of pumps 14I-7/00) [69-]

14I-5/02	. Pumping cooling-air; Arrangements of cooling-air pumps, e.g. fans or blowers	[69-]
14I-5/04	. . Pump-driving arrangements	[69-]
14I-5/06	. . Guiding or ducting air to or from ducted fans	[69-]
14I-5/08	. . Use of engine exhaust gases for pumping cooling-air	[69-]
14I-5/10	. Pumping liquid coolant; Arrangements of coolant pumps	[69-]
14I-5/12	. . Pump-driving arrangements	[69-]
14I-5/14	. Safety means against, or active at, failure of coolant-pump drives, e.g. shutting engine down; Means for indicating functioning of coolant pumps	[69-]

14I-7/00 Controlling of coolant flow [69-]

14I-7/02	. the coolant being cooling-air	[69-]
14I-7/04	. . by varying pump speed, e.g. by changing pump-drive gear ratio	[69-]
14I-7/06	. . by varying blade pitch	[69-]
14I-7/08	. . by cutting in or out of pumps	[69-]
14I-7/10	. . by throttling amount of air flowing through liquid-to-air heat-exchangers	[69-]
14I-7/12	. . . by thermostatic control	[69-]
14I-7/14	. the coolant being liquid	[69-]
14I-7/16	. . by thermostatic control	[69-]

14I-9/00 Cooling having pertinent characteristics not provided for in, or of interest apart from, groups 14I-1/00 to 14I-7/00 (profiting from waste heat of combustion-engine cooling 46d) [69-]

14I-9/02	. Cooling by evaporation, e.g. by spraying water on to cylinders (evaporation and condensation of liquid coolant in closed cycles 14I-3/22)	[69-]
14I-9/04	. by simultaneous or alternative use of direct air cooling and liquid cooling (14I-9/02 takes precedence)	[69-]
14I-9/06	. by use of refrigerating apparatus, e.g. of compressor or absorber type	[69-]

14I-11/00 Component parts, details, or accessories, not provided for in, or of interest apart from, groups 14I-1/00 to 14I-9/00 [69-]

14I-11/02	. Liquid-coolant overflow, venting, or draining devices (automatic draining during freezing conditions 14I-11/20)	[69-]
14I-11/04	. Arrangements of liquid pipes or hoses	[69-]
14I-11/06	. Cleaning (in general 12d, 12e); Combating corrosion (in general 48d1)	[69-]
14I-11/08	. Arrangements of lubricant coolers (in lubrication apparatus 14i)	[69-]
14I-11/10	. Guiding or ducting cooling-air to or from liquid-to-air heat-exchangers	[69-]
14I-11/12	. Filtering, cooling, or silencing cooling-air	[69-]
14I-11/14	. Indicating devices; Other safety devices	[69-]
14I-11/16	. . concerning coolant temperature (14I-11/20 takes precedence)	[69-]
14I-11/18	. . concerning coolant pressure, coolant flow, or liquid-coolant level	[69-]
14I-11/20	. . concerning atmospheric freezing conditions, e.g. automatically draining or heating during frosty weather	[69-]