SECTION F — MECHANICAL ENGINEERING; LIGHTING; HEATING; WEAPONS; BLASTING

F01 MACHINES OR ENGINES IN GENERAL; ENGINE PLANTS IN GENERAL; STEAM ENGINES

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 F02; steam generation F22; nuclear power plants, engine arrangements therein G21D)

Note(s)

Attention is drawn to the Notes preceding class F01, especially as regards the definitions of "steam" and "special vapour".

Subclass index

STEAM ENGINE PLANTS
- Characterised by the use of
  - accumulators or heaters; storing means in alkali; specific types of engines....3/00, 5/00, 7/00
  - special steam systems, cycles, or processes....7/00
- Characterised by the disposition of
  - condenser; structural combination of engine and boiler or condenser....9/00, 11/00
- Not otherwise provided for....21/00
- General layout or operation; adaptations for special use....13/00, 15/00
- Utilisation of steam
  - for feed-water heating; in the regeneration or other treating; for other purposes....7/34, 19/00, 17/00

ENGINE PLANTS NOT RESTRICTED TO STEAM UTILISATION
- With several engines driven by different fluids....23/00
- Not otherwise provided for, other types with special working fluids or working with enclosed cycles....25/00, 27/00

STEAM ACCUMULATORS....1/00

SPECIAL TYPES OF ENGINES
- Steam engines....7/00
- Other than steam....25/00

1/00 Steam accumulators (use of accumulators in steam engine plants F01K 3/00) **[1, 2006.01]**

1/02 • for storing steam otherwise than in a liquid **[1, 2006.01]**

1/04 • for storing steam in a liquid, e.g. Ruth type (in alkali to increase steam pressure F22B 1/20) **[1, 2006.01]**

1/06 • • Internal fittings facilitating steam distribution, steam formation, or circulation (acting during charging or discharging F01K 1/08; fittings facilitating circulation through multiple accumulators F01K 1/14) **[1, 2006.01]**

1/08 • Charging or discharging of accumulators with steam (peculiar to multiple accumulators F01K 1/12) **[1, 2006.01]**

1/10 • specially adapted for superheated steam **[1, 2006.01]**

1/12 • Multiple accumulators; Charging, discharging, or regulating peculiar thereto **[1, 2006.01]**

1/14 • • Circulation **[1, 2006.01]**

1/16 • Other safety or regulating means **[1, 2006.01]**

1/18 • • for steam pressure **[1, 2006.01]**

1/20 • Other steam-accumulator parts, details, or accessories **[1, 2006.01]**

Steam engine plants

3/00 Plants characterised by the use of steam or heat accumulators, or intermediate steam heaters, therein (regenerating exhaust steam F01K 19/00) **[1, 2006.01]**

3/02 • Use of accumulators and specific engine types; Regulating thereof **[1, 2006.01]**

3/04 • • the engine being of multiple-inlet-pressure type **[1, 2006.01]**

3/06 • • the engine being of extraction or non-condensing type **[1, 2006.01]**

3/08 • Use of accumulators, the plant being specially adapted for a specific use **[1, 2006.01]**

3/10 • • for vehicle drive, e.g. for accumulator locomotives **[1, 2006.01]**

3/12 • having two or more accumulators **[1, 2006.01]**

3/14 • having both steam accumulator and heater, e.g. superheating accumulator (steam superheaters per se F22G) **[1, 2006.01]**

3/16 • • Mutual arrangement of accumulator and heater **[1, 2006.01]**

3/18 • having heaters (having both steam accumulator and heater F01K 3/14; steam heaters per se F22) **[1, 2006.01]**

3/20 • • with heating by combustion gases of main boiler **[1, 2006.01]**
3/22 • • • Controlling, e.g. starting, stopping **[1, 2006.01]**
3/24 • • with heating by separately-fired heaters **[1, 2006.01]**
3/26 • • with heating by steam **[1, 2006.01]**

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 [1, 2006.01]
5/02 • used in regenerative installation **[1, 2006.01]**

7/00 Steam engine plants characterised by the use of specific types of engine (F01K 3/02 takes precedence)**; Plants or engines characterised by their use of special steam systems, cycles, or processes** (reciprocating-piston engines using uniflow principle F01B 17/04)**; Regulating means peculiar to such systems, cycles, or processes; Use of withdrawn or exhaust steam for feed-water heating [1, 2006.01]**
7/02 • the engines being of multiple-expansion type (the engines being only of turbine type F01K 7/16; the engines using steam of critical or over-critical pressure F01K 7/32; the engines being of extraction or non-condensing type F01K 7/34) **[1, 2006.01]**
7/04 • • Regulating means peculiar thereto **[1, 2006.01]**
7/06 • the engines being of multiple-inlet-pressure type (F01K 7/02 takes precedence; the engines being only of turbine type F01K 7/16; the engines using steam of critical or over-critical pressure F01K 7/32; the engines being of extraction or non-condensing type F01K 7/34) **[1, 2006.01]**
7/08 • • Regulating means peculiar thereto **[1, 2006.01]**
7/10 • characterised by the engine exhaust pressure (the engines being only of turbine type F01K 7/16; the engines using steam of critical or over-critical pressure F01K 7/32; the engines being of extraction or non-condensing type F01K 7/34) **[1, 2006.01]**
7/12 • • of condensing type **[1, 2006.01]**
7/14 • • • Regulating means peculiar thereto **[1, 2006.01]**
7/16 • the engines being only of turbine type (the engines using steam of critical or over-critical pressure F01K 7/32; the engines being of extraction or non-condensing type F01K 7/34) **[1, 2006.01]**
7/18 • • the turbine being of multiple-inlet-pressure type **[1, 2006.01]**
7/20 • • • Regulating means peculiar thereto **[1, 2006.01]**
7/22 • • the turbines having inter-stage steam heating **[1, 2006.01]**
7/24 • • • Regulating or safety means peculiar thereto **[1, 2006.01]**
7/26 • • the turbines having inter-stage steam accumulation **[1, 2006.01]**
7/28 • • • Regulating means peculiar thereto **[1, 2006.01]**
7/30 • • the turbines using exhaust steam only **[1, 2006.01]**
7/32 • the engines using steam of critical or over-critical pressure **[1, 2006.01]**
7/34 • the engines being of extraction or non-condensing type; Use of steam for feed-water heating (feed-water heaters in general F22D) **[1, 2006.01]**
7/36 • • the engines being of positive-displacement type **[1, 2006.01]**
7/38 • • the engines being of turbine type **[1, 2006.01]**
7/40 • • Use of two or more feed-water heaters in series **[1, 2006.01]**
7/42 • • Use of desuperheaters for feed-water heating **[1, 2006.01]**
7/44 • • Use of steam for feed-water heating and another purpose **[1, 2006.01]**

9/00 Steam engine plants characterised by condensers arranged or modified to co-operate with the engines (by condensers structurally combined with engines F01K 11/00; steam condensers per se F28B) **[1, 2006.01]**
9/02 • Arrangements or modifications of condensate or air pumps **[1, 2006.01]**
9/04 • with dump valves to by-pass stages **[1, 2006.01]**

11/00 Steam engine plants characterised by the engines being structurally combined with boilers or condensers [1, 2006.01]
11/02 • the engines being turbines **[1, 2006.01]**
11/04 • the boilers or condensers being rotated in use **[1, 2006.01]**

13/00 General layout or general methods of operation, of complete steam engine plants [1, 2006.01]
13/02 • Regulating, e.g. stopping or starting **[1, 2006.01]**

15/00 Adaptations of steam engine plants for special use [1, 2006.01]
15/02 • for driving vehicles, e.g. locomotives (arrangements in vehicles, see the relevant vehicle classes) **[1, 2006.01]**
15/04 • • the vehicles being waterborne vessels **[1, 2006.01]**

17/00 Use of steam or condensate extracted or exhausted from steam engine plant (for heating feed-water F01K 7/34; returning condensate to boiler F22D) **[1, 2006.01]**
17/02 • for heating purposes, e.g. industrial, domestic (F01K 17/06 takes precedence; domestic- or space-heating systems, e.g. central-heating systems, in general F24D 1/00, F24D 3/00, F24D 9/00) **[1, 3, 2006.01]**
17/04 • for specific purposes other than heating (F01K 17/06 takes precedence) **[1, 2006.01]**
17/06 • Returning energy of steam, in exchanged form, to process, e.g. use of exhaust steam for drying solid fuel of plant **[1, 2006.01]**

19/00 Regenerating or otherwise treating steam exhaust from steam engine plant (plants characterised by use of means for storing steam in an alkali to increase steam pressure F01K 5/00; returning condensate to boiler F22D) **[1, 2006.01]**
19/02 • Regenerating by compression **[1, 2006.01]**
19/04 • • in combination with cooling or heating **[1, 2006.01]**
19/06 • • in engine cylinder **[1, 2006.01]**
19/08 • • compression done by injection apparatus, jet blower, or the like **[1, 2006.01]**
19/10 • Cooling exhaust steam other than by condenser; Rendering exhaust steam invisible **[1, 2006.01]**

21/00 Steam engine plants not otherwise provided for [1, 2006.01]
21/02 • with steam generation in engine cylinders **[1, 2006.01]**
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 in general F22B) **[1, 2006.01]**
21/06 • Treating live steam, other than thermodynamically, e.g. for fighting deposits in engine **[1, 2006.01]**

23/00 Plants characterised by more than one engine delivering power external to the plant, the engines being driven by different fluids [1, 2006.01]

23/02 • the engine cycles being thermally coupled **[1, 2006.01]**

23/04 • • condensation heat from one cycle heating the fluid in another cycle **[1, 2006.01]**

23/06 • • combustion heat from one cycle heating the fluid in another cycle **[1, 2006.01]**

23/08 • • • with working fluid of one cycle heating the fluid in another cycle **[1, 2006.01]**

23/10 • • • with exhaust fluid of one cycle heating the fluid in another cycle **[1, 2006.01]**

23/12 • the engines being mechanically coupled (F01K 23/02 takes precedence) **[1, 2006.01]**

23/14 • • including at least one combustion engine **[1, 2006.01]**

23/16 • • all the engines being turbines (F01K 23/14 takes precedence) **[1, 2006.01]**

23/18 • characterised by adaptation for specific use **[1, 2006.01]**

25/00 Plants or engines characterised by use of special working fluids, not otherwise provided for; Plants operating in closed cycles and not otherwise provided for [1, 2006.01]

25/02 • the fluid remaining in the liquid phase **[1, 2006.01]**

25/04 • the fluid being in different phases, e.g. foamed **[1, 2006.01]**

25/06 • using mixtures of different fluids (plants using mixtures of steam and gas F01K 21/04) **[1, 2006.01]**

25/08 • using special vapours **[1, 2006.01]**

25/10 • • the vapours being cold, e.g. ammonia, carbon dioxide, ether **[1, 2006.01]**

25/12 • • the vapours being metallic, e.g. mercury **[1, 2006.01]**

25/14 • • using industrial or other waste gases **[1, 2006.01]**

27/00 Plants for converting heat or fluid energy into mechanical energy, not otherwise provided for [1, 2006.01]

27/02 • Plants modified to use their waste heat, other than that of exhaust, e.g. engine-friction heat **[1, 2006.01]**