

F03 MACHINES OR ENGINES FOR LIQUIDS (for liquids and elastic fluids F01; positive-displacement machines for liquids F04); **WIND, SPRING, OR WEIGHT MOTORS; PRODUCING MECHANICAL POWER OR A REACTIVE PROPULSIVE THRUST, NOT OTHERWISE PROVIDED FOR**

F03B MACHINES OR ENGINES FOR LIQUIDS (machines or engines for liquids and elastic fluids F01; positive-displacement engines for liquids F03C; positive-displacement machines for liquids F04)

Notes

- (1) This subclass covers:
 - engines, other than of positive-displacement type, driven by liquids;
 - machines, other than of positive-displacement type, for liquids.
- (2) Attention is drawn to the Notes preceding class F01, especially as regards the definition of “reaction type”.

Subclass Index

TURBINES: IMPULSE; REACTION	1/00; 3/00	PARTS OR DETAILS OF ABOVE KINDS	1/00, 3/00, 11/00
MACHINES OR ENGINES: NON-BLADED ROTOR TYPE; WATER WHEELS;		ADAPTATIONS OR COMBINATIONS	13/00
ENDLESS-CHAIN TYPE	5/00; 7/00; 9/00	CONTROLLING	15/00
		OTHER MACHINES OR ENGINES	17/00

Non-positive-displacement machines or engines characterised by specified type, e.g. water turbines (adaptations of machines or engines for special use F03B 13/00; controlling F03B 15/00)

- 1/00 Engines of impulse type, i.e. turbines with jets of high-velocity liquid impinging on bladed or like rotors, e.g. Pelton wheels; Parts or details peculiar thereto**
 - 1/02 . Buckets; Bucket-carrying rotors
 - 1/04 . Nozzles (in general B05B); Nozzle-carrying members
- 3/00 Machines or engines of reaction type; Parts or details peculiar thereto**
 - 3/02 . with radial flow at high-pressure side and axial flow at low-pressure side of rotors, e.g. Francis turbines
 - 3/04 . with substantially axial flow throughout rotors, e.g. propeller turbines
 - 3/06 . . with adjustable blades, e.g. Kaplan turbines
 - 3/08 . with pressure/velocity transformation exclusively in rotors
 - 3/10 . characterised by having means for functioning alternatively as pumps or turbines
 - 3/12 . Blades; Blade-carrying rotors
 - 3/14 . . Rotors having adjustable blades
 - 3/16 . Stators
 - 3/18 . . Stator blades; Guide conduits or vanes, e.g. adjustable
- 5/00 Machines or engines characterised by non-bladed rotors, e.g. serrated, using friction**
- 7/00 Water wheels**
- 9/00 Endless-chain type machines or engines**

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- 11/00 Parts or details not provided for in, or of interest apart from, groups F03B 1/00 to F03B 9/00** (controlling F03B 15/00)
 - 11/02 . Casings
 - 11/04 . for diminishing cavitation or vibration, e.g. balancing
 - 11/06 . Bearing arrangements
 - 11/08 . for removing foreign matter, e.g. mud

13/00 Adaptations of machines or engines for special use; Combinations of machines or engines with driving or driven apparatus (if the apparatus aspects are predominant, see the relevant places for such apparatus, e.g. H02K 7/18); **Power stations or aggregates** (hydraulic-engineering aspects E02B; incorporating only machines or engines of positive-displacement type F03C)

- 13/02 . Adaptations for drilling wells
- 13/04 . Adaptations for use in dentistry
- 13/06 . Stations or aggregates of water-storage type (turbines characterised by having means for functioning alternatively as pumps F03B 3/10)
- 13/08 . Machine or engine aggregates in dams or the like; Conduits therefor
- 13/10 . Submerged units incorporating electric generators or motors
- 13/12 . characterised by using wave or tide energy
- 13/14 . . using wave energy [4]
- 13/16 . . . using the relative movement between a wave-operated member and another member [4]
- 13/18 wherein the other member is fixed, at least at one point, with respect to the sea bed or shore [4]
- 13/20 wherein both members are movable relative to the sea bed or shore [4]
- 13/22 . . . using the flow of water resulting from wave movements, e.g. to drive a hydraulic motor or turbine [4]
- 13/24 . . . to produce a flow of air, e.g. to drive an air turbine [4]
- 13/26 . . using tide energy [4]

- 15/00 Controlling** (controlling in general G05)
 - 15/02 . by varying liquid flow
 - 15/04 . . of turbines (rotors having adjustable blades F03B 3/06, F03B 3/14; adjustable guide vanes F03B 3/18; specially adapted for turbines with jets of high-velocity liquid impinging on bladed or like rotors F03B 15/20)
 - 15/06 . . . Regulating, i.e. acting automatically

15/08	. . . . by speed, e.g. by measuring electric frequency or liquid flow	15/20	. . specially adapted for turbines with jets of high-velocity liquid impinging on bladed or like rotors (nozzles F03B 1/04)
15/10	. . . . without retroactive action	15/22	. . . for safety purposes
15/12	. . . . with retroactive action	17/00	Other machines or engines
15/14	. . . . by or of water level	17/02	. using hydrostatic thrust
15/16	. . . . by power output	17/04	. . Alleged <i>perpetua mobilia</i>
15/18	. . . . for safety purposes, e.g. preventing overspeed	17/06	. using liquid flow, e.g. of swinging-flap type

F03C POSITIVE-DISPLACEMENT ENGINES DRIVEN BY LIQUIDS (positive-displacement engines for liquids and elastic fluids F01; positive-displacement machines for liquids F04; fluid-pressure actuators F15B; fluid gearing F16H)

Note

Attention is drawn to the Notes preceding class F01, especially as regards the definitions of “positive displacement”, “rotary-piston machines”, “oscillating-piston machines”, “rotary-piston”, “co-operating members”, “movement of co-operating members”, “teeth or tooth-equivalents”, and “internal axis”.

1/00	Reciprocating-piston liquid engines	1/34	. Distribution members specially adapted for multiple-cylinder engines [5]
1/007	. with single cylinder, double-acting piston [5]	1/36	. . Cylindrical distribution members [5]
1/013	. with single cylinder, single-acting piston [5]	1/38	. . Plate-like distribution members [5]
1/02	. with multiple cylinders, characterised by the number or arrangement of cylinders (with movable cylinders F03C 1/22; of flexible-wall type F03C 5/02)	1/40	. Control specially adapted therefor [5]
1/03	. . with movement in two directions being obtained by two single-acting piston liquid engines, each acting in one direction [5]	2/00	Rotary-piston engines (in which the liquid exclusively displaces one or more piston reciprocating in rotary cylinders F03C 1/24) [3]
1/04	. . with cylinders in star- or fan-arrangement	Note	
1/047	. . . the pistons co-operating with an actuated element at the outer ends of the cylinders [5]		Group F03C 2/30 takes precedence over groups F03C 2/02 to F03C 2/24. [3]
1/053	. . . the pistons co-operating with an actuated element at the inner ends of the cylinders [5]	2/02	. of arcuate-engagement type, i.e. with circular translatory movement of co-operating members, each member having the same number of teeth or tooth-equivalents [3]
1/06	. . with cylinder axes generally coaxial with, or parallel or inclined to, main shaft axis	2/08	. of intermeshing-engagement type, i.e. with engagement of co-operating members similar to that of toothed gearing [3]
1/08	. Distributing valve-gear peculiar thereto (for multiple-cylinder engines F03C 1/34; for engines with positive displacement in general F01L)	2/22	. of internal-axis type with equidirectional movement of co-operating members at the points of engagement, or with one of the co-operating members being stationary, the inner member having more teeth or tooth-equivalents than the outer member [3]
1/10	. . actuated by piston or piston-rod	2/24	. of counter-engagement type, i.e. the movement of co-operating members at the points of engagement being in opposite directions [3]
1/12	. . . mechanically [5]	2/30	. having the characteristics covered by two or more of groups F03C 2/02, F03C 2/08, F03C 2/22, F03C 2/24 or having the characteristics covered by one of these groups together with some other type of movement between co-operating members [3]
1/14	. . actuated by the driving liquid of the engine [5]	4/00	Oscillating-piston engines [3]
1/16	. . Speed controlling, equalising, or cushioning [5]	5/00	Other engines
1/20	. . specially adapted for engines generating vibration only	5/02	. of flexible-wall type
1/22	. with movable cylinders		
1/24	. . in which the liquid exclusively displaces one or more pistons reciprocating in rotary cylinders		
1/247	. . . with cylinders in star- or fan-arrangement [5]		
1/253	. . . with cylinder axes generally coaxial with, or parallel to, main shaft axis [5]		
1/26	. adapted for special use or combined with apparatus driven thereby (aspects predominantly concerning the driven apparatus, <u>see</u> the relevant classes for such apparatus)		
1/28	. Pistons specially adapted therefor [5]		
1/30	. Cams specially adapted therefor [5]		
1/32	. Cylinders specially adapted therefor [5]		

F03D WIND MOTORS**Note**

In this subclass, the following terms or expressions are used with the meanings indicated:

- “wind motor” means a mechanism for converting the energy of natural wind into useful mechanical power, and the transmission of such power to its point of use;
- “rotor” means the wind-engaging parts of the wind motor and the rotary member carrying them;
- “rotation axis” means the axis of rotation of the rotor.

1/00	Wind motors with rotation axis substantially in wind direction (controlling F03D 7/00)	7/00	Controlling wind motors
1/02	· having a plurality of rotors	7/02	· the wind motors having rotation axis substantially in wind direction
1/04	· having stationary wind-guiding means, e.g. with shrouds or channels (F03D 1/02 takes precedence)	7/04	· . Regulation, i.e. controlling automatically
1/06	· Rotors	7/06	· the wind motors having rotation axis substantially at right angle to wind direction
3/00	Wind motors with rotation axis substantially at right angle to wind direction (controlling F03D 7/00)	9/00	Adaptations of wind motors for special use; Combinations of wind motors with apparatus driven thereby (aspects predominantly concerning driven apparatus, <u>see</u> the relevant classes for such apparatus)
3/02	· having a plurality of rotors	9/02	· the apparatus storing power
3/04	· having stationary wind-guiding means, e.g. with shrouds or channels (F03D 3/02 takes precedence)	11/00	Details, component parts, or accessories not provided for in, or of interest apart from, the other groups of this subclass
3/06	· Rotors	11/02	· Transmission of power, e.g. using hollow exhausting blades
5/00	Other wind motors (controlling F03D 7/00)	11/04	· Mounting structures
5/02	· the wind-engaging parts being attached to endless chains or the like		
5/04	· the wind-engaging parts being attached to carriages running on tracks or the like		
5/06	· the wind-engaging parts swinging to-and-fro and not rotating		

F03G SPRING, WEIGHT, INERTIA, OR LIKE MOTORS; MECHANICAL-POWER-PRODUCING DEVICES OR MECHANISMS, NOT OTHERWISE PROVIDED FOR OR USING ENERGY SOURCES NOT OTHERWISE PROVIDED FOR (arrangements in connection with power supply in vehicles from force of nature B60K 16/00; electric propulsion with power supply in vehicles from force of nature B60L 8/00)

Note

In this subclass, the following term is used with the meaning indicated:

- “motors” means mechanisms for producing mechanical power from potential energy of solid bodies.

1/00	Spring motors (spring-driven toys A63H; springs in general F16F; precision time mechanisms, e.g. for clocks or watches, G04B)	4/00	Devices for producing mechanical power from geothermal energy [5]
1/02	· characterised by shape or material of spring, e.g. helical, spiral, coil	4/02	· with direct fluid contact [5]
1/04	· . using rubber springs	4/04	· with deep-well turbo-pump [5]
1/06	· Other parts or details	4/06	· with fluid flashing [5]
1/08	· . for winding	5/00	Devices for producing mechanical power from muscle energy (driving cycles B62M)
1/10	· . for producing output movement other than rotary, e.g. vibratory	5/02	· of endless-walk type, e.g. treadmills
3/00	Other motors, e.g. gravity or inertia motors	5/04	· . Horsemills or the like
3/02	· using wheels with circumferentially-arranged compartments co-operating with solid falling bodies (F03G 3/04 takes precedence)	5/06	· other than of endless-walk type
3/04	· driven by sand or like fluent solid material	5/08	· . for combined actuation by different limbs, e.g. hand and leg
3/06	· using pendulums	6/00	Devices for producing mechanical power from solar energy (solar boilers F24) [5]
3/08	· using flywheels	6/02	· using a single state working fluid [5]
		6/04	· . gaseous [5]
		6/06	· with solar energy concentrating means [5]

F03G – F03H

7/00	Mechanical-power-producing mechanisms, not otherwise provided for or using energy sources not otherwise provided for	7/06	. using expansion or contraction of bodies due to heating, cooling, moistening, drying, or the like (using thermal expansion of non-vaporising liquids F01K)
7/04	. using pressure differences or thermal differences occurring in nature (F03G 7/06 takes precedence)	7/08	. recovering energy derived from swinging, rolling, pitching, or like movements, e.g. from the vibrations of a machine
7/05	. . Ocean thermal energy conversion, i.e. OTEC [5]	7/10	. Alleged <u>perpetua mobilia</u> (using hydrostatic thrust F03B 17/04)

F03H PRODUCING A REACTIVE PROPULSIVE THRUST, NOT OTHERWISE PROVIDED FOR (from combustion products F02K)

1/00	Use of plasma to produce a reactive propulsive thrust (generating plasma H05H 1/00)	5/00	Producing a reactive propulsive thrust, not otherwise provided for
3/00	Use of photons to produce a reactive propulsive thrust		