

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

### F03 MACHINES OR ENGINES FOR LIQUIDS; 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)

#### Note(s)

- This subclass covers:
  - engines, other than of positive-displacement type, driven by liquids;
  - machines, other than of positive-displacement type, for liquids.
- 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
MACHINES OR ENGINES: NON-BLADED ROTOR TYPE; WATER WHEELS; ENDLESS-CHAIN TYPE.....	5/00, 7/00, 9/00
PARTS OR DETAILS OF ABOVE KINDS.....	1/00, 3/00, 11/00
ADAPTATIONS OR COMBINATIONS.....	13/00
CONTROLLING.....	15/00
OTHER MACHINES OR ENGINES.....	17/00

#### 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

#### 11/00 Parts or details not provided for in, or of interest apart from, groups F03B 1/00-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]

## F03B

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