HYDRAULIC ENGINEERING; FOUNDATIONS; SOIL SHIFTING

HYDRAULIC ENGINEERING (ship-lifting E02C; dredging E02F)

WARNING

In this subclass non-limiting references (in the sense of paragraph 39 of the Guide to the IPC) may still be displayed in the scheme.

1/00 Equipment or apparatus for, or methods of, general hydraulic engineering [{ e.g. protection of constructions against ice-strains (protection of offshore constructions against ice-loads E02B 17/0021; ice-structures as artificial islands E02B 17/028)]

1/01 . . . (Mechanically induced gas or liquid streams in seas, lakes or water-courses for forming weirs or breakwaters; making or keeping water surfaces free from ice, aerating or circulating water, e.g. screens of air-bubbles against sludge formation or salt water entry, pump-assisted water circulation (moving sediments E02B 3/023; for ice breakers B63B 35/08; aerating or circulating water in fish-tanks A01K 63/042; purification of waste water with addition of air E02F; distributing gases in liquids in general B01F 3/04))

1/02 . . . Hydraulic models [(towing tanks or basins for model vessels B63B 3/02)]

3/00 Engineering works in connection with control or use of streams, rivers, coasts, or other marine sites (barrages or weirs E02B 7/00); Sealings or joints for engineering works in general

3/02 . . . Stream regulation, e.g. breaking up subaqueous rock, cleaning the beds of waterways, directing the water flow (harvesting water plants A01D 44/00; underwater loosening of soil or rocks for foundation construction E02D 17/16); dredging or scraping devices E02F 3/02)

3/04 . . . Structures or apparatus for, or methods of, protecting banks, coasts, or harbours (E02B 1/003 takes precedence; sealing or joints E02B 3/16)

3/041 . . . (using active mechanical means, e.g. fluidizing or pumping)

3/043 . . . [Artificial seaweed]

3/046 . . . [Artificial reefs]

3/06 . . . Moles; Piers; Quay walls; Groynes; Breakwaters [Wave dissipating walls; Quay equipment]
3/16 . Sealings or joints (E02B 3/12 takes precedence; sealings for specific structural foundation elements, see the relevant groups for those elements; sealings for barrage or lock gates E02B 7/54); joints for foundation structures E02D 29/16; sealing joints not restricted to hydraulic engineering work E04B 1/68)

3/18 . Reclamation of land from water (or marshes) (drainage of soil E02B 11/00)

3/20 . Equipment for shipping on coasts, in harbours or on other fixed marine structures, e.g. bollards (tying-up, anchoring B63B 21/00); buoys B63B 22/00 (equipment specially adapted for use in locks or dry docks E02C 1/10)

3/24 . Mooring posts

3/26 . Fenders (fenders for protecting offshore constructions E02B 17/003); fenders integral with waterborne vessels or specially adapted therefor B63B 59/02)

3/28 . Fender piles

5/00 Artificial water canals, [e.g. irrigation canals]
(for water-power plants E02B 9/02; irrigation of soil E02B 13/00)

5/005 . (Canals entirely situated above ground level, e.g. on piers (canal bridges E01D 18/00)

5/02 . Making or lining canals (lining in general E02B 13/02; digging canals E02F)

5/04 . Navigable canals

5/06 . Operating equipment in connection with canals (ship-lifting devices E02C)

5/08 . Details, e.g. gates, screens

NOTE
This subdivision is limited to closures, devices for arresting waterborne materials and divisors

5/082 . (Closures (for irrigation conduits E02B 13/02)

5/085 . ( Arresting devices for waterborne materials, e.g. gratings (fish barrages E02B 1/006; removing sediments E02B 3/023; arresting oil or similar pollutants E02B 15/08; for waste water purification E02F; in sewers E03F 5/14)

5/087 . (Divisors)

7/00 Barrages or weirs; Layout, construction, methods of, or devices for, making same (for protecting banks, coasts, or harbours E02B 3/04; sealings or joints E02B 3/16; handling building or like materials for hydraulic engineering E02D 15/00; foundations in general E02D 27/00)

7/005 . (Deformable barrages or barrages consisting of permanently deformable elements, e.g. inflatable, with flexible walls (closures E02B 7/54; floating oil barrages E02B 15/08)

7/02 . Fixed barrages

7/04 . Dams across valleys

7/06 . Earth-fill dams; Rock-fill dams

7/08 . Wall dams

7/10 . Gravity dams, i.e. those in which the weight of the structure prevents overturning

7/12 . Arch dams

7/14 . Buttress dams

7/16 . Fixed weirs; Superstructures or flash-boards therefor

7/18 . Siphon weirs (siphons in hydraulic engineering in general E02B 29/08)

7/20 . Movable barrages; Lock (or dry-dock) gates

7/205 . (Barrages controlled by the variations of the water level; automatically functioning barrages (level regulators E05D 9/00; the documents are filed in this subdivision and the relevant subdivision E02B 7/26 - E02B 7/50)

7/22 . Stop log dams; Emergency gates

7/24 . Needle weirs

7/26 . Vertical-lift gates

7/28 . with sliding gates

7/30 . with guide wheels or rollers for the gates

7/32 . Cylindrical or tubular gates

7/34 . Flash-boards for vertical-lift gates

7/36 . Elevating mechanisms for vertical-lift gates

7/38 . Rolling gates (or gates moving horizontally in their own plane, e.g. by sliding)

7/40 . Swinging or turning gates

7/42 . Gates of segmental or sector-like shape with horizontal axis

7/44 . Hinged-leaf gates

7/46 . Gates turning round a horizontal axis arranged midway of the flap

7/48 . Roof or double shutter gates

7/50 . Floating gates

7/52 . Equipment preventing vibration of gates

7/54 . Sealings for gates

8/00 Details of barrages or weirs (cleaning or keeping clear the surface of open water E02B 15/00); Energy dissipating devices carried by lock or dry-dock gates

8/02 . Sediment base gates; Sand sluices; Structures for retaining arresting waterborne material

8/023 . (Arresting devices for waterborne materials (E02B 1/003 takes precedence; in artificial watercourses E02B 5/085; arresting oil or the like E02B 15/08; sieving devices for waste water purification E02F; in sewers E03F 5/14)

8/026 . . (Cleaning devices (for fish barrages E02B 1/006)

8/04 . Valves, slides, or the like; (Arrangements therefor; Submerged sluice gates

8/045 . (automatically movable)

8/06 . Spillways; Devices for dissipation of energy, e.g. for reducing eddies (also for lock or dry-dock gates)

8/08 . Fish passes (or other means providing for migration of fish); Passages for rafts or boats

8/085 . (Devices allowing fish migration, e.g. fish traps (arresting or diverting fish exclusively E02B 1/006)

9/00 Water-power plants; Layout, construction or equipment, methods of, or apparatus for, making same

9/02 . Water-ways

9/022 . (Closures)

9/025 . (automatically movable)

9/027 . (Sliding closures (E02B 9/025 takes precedence)

9/04 . Free-flow canals or flumes; Intakes (gratings or screens therefor E02B 5/08)
Pressure galleries or pressure conduits; Galleries specially adapted to house pressure conduits;
Means specially adapted for use therewith, e.g. housings, valves, gates (driving inclined galleries E21D 9/02; valves in general F16K; conduits in general F16L)

Tide or wave power plants (water-pressure machines, tide or wave motors E02B)

Drainage of soil, e.g. for agricultural purposes (draining sports grounds E01C 13/083; for consolidating foundation soil, e.g. sand drain piles E20D 3/101)

(Drainage conduits)

Drainage device- laying apparatus, e.g. drainage ploughs

**WARNING**

Group E02B 11/02 is incomplete, see also E02F 3/00 and E02F 5/00; dredgers and soil-shifting machines

Irrigation ditches, i.e. gravity flow, open channel water distribution systems (retaining waterborne material in irrigation canals E02B 5/085; other distribution systems for watering or spraying gardens, fields, sports grounds, or the like, A01G 25/00; (built-in irrigation means for sports grounds E01C 13/083))

Closures for irrigation conduits

Cleaning or keeping clear the surface of open water; Apparatus therefor (construction of ships or other waterborne vessels B63B, e.g. vessels specially adapted for collecting pollution from open water B63B 35/32; in swimming or splash baths or pools E04H 4/16)

(Tent-like structures for dealing with pollutant emissions below the water surface)

from ice (otherwise than according to E02B 1/003) (construction of ships B63B; ice-breakers or amphibious vehicles B63B 35/08; protecting hydraulic engineering structures against ice-load E02B 1/001))

Devices for cleaning or keeping clear the surface of open water from oil or like floating materials by separating or removing these materials (stopping water-borne material at a surface of open water; E02B 15/041 (stopping water-borne material in artificial water canals E02B 5/085; stopping water-borne material at barrages orweirs E02B 8/023); other treatment of water, waste water or sewage C02F; materials for treating liquid pollutants, e.g. oil, gasoline, fat, C09K 3/32 (; separation of oil in sewage conduits E03F 5/16))

Devices for distributing materials, e.g. absorbed or magnetic particles over a surface of open water to remove the oil, with or without means for picking up the treated oil (E02B 15/042 takes precedence))

Devices for removing the oil by combustion with or without means for picking up the oil)

Devices or methods for removing oil by means of freezing)

Devices for recovering oil floating on a surface of open water (E02B 15/043 takes precedence; separation in general B01D)

Collection of oil using vessels, i.e. boats, barges)

provided with an oil collecting boom arranged on at least one side of the hull)

(Oil collectors moved over the water skimming the water surface)

Barriers therefor (E02B 15/08 takes precedence) (constrained for applying processing agents or for collecting pollutants, e.g. absorbent) Devices for reducing the polluted area (with or without additional devices for) removing the material

(with stabilising elements)

(with underwater curtains)

[adapted for protection against fire or extreme heat]

(fixed to the side of a boat for containing small leaks in the hull)

(fixed to permanent structure, e.g. harbour wall or river bank)

[adapted to be towed for operation]

[Details of connectors]

[Buoyancy material]

[Air (E02B 15/0878 takes precedence)]

[Self-inflating barriers]

[Air and water]

[Foam]

[using expanded polystyrene foam]

Devices for removing the material from the surface (E02B 15/041, E02B 15/042, E02B 15/06 take precedence)

[Means floating loosely on the water absorbing the oil (absorbing materials C02F)]

[Discs]

[Rotary drums]

[Conveyors; Paddle wheels; Endless belts (E02B 15/101, takes precedence)]

[Archimedian screws]

[Overflow skimmers with suction heads; suction heads]

[Whirling means forming a vortex in the water; cyclones]

[Ejection means]

Artificial islands mounted on piles or like supports, e.g. platforms on raisable legs (or offshore constructions); Construction methods therefor (construction methods for floating platforms B63B 9/065); anchoring floating platforms B63B 21/00; floating platforms, e.g. anchored, B63B 35/44; [underwater reservoirs B65D 88/78])

[Nodal points]

[Methods for grouting offshore structures; apparatus therefor (cementing boreholes E21B 33/13)]

[Tube closures for releasable sealing hollow tubes]

[Means for protecting offshore constructions]

[against ice-loads]

[against corrosion]

[Fenders]

[Maintenance, repair or inspection of offshore constructions]

[Methods for placing the offshore structure]

[Placing the offshore structure on a pre-installed foundation structure]
2017/0052  . [Removal or dismantling of offshore structures from their offshore location]
2017/0056  . [Platforms with supporting legs]
2017/006  . . [with lattice style supporting legs]
2017/0065  . . [Monopile structures]
2017/0069  . . [Gravity structures]
2017/0073  . . [Details of sea bottom engaging footing]
2017/0078  . . . [Suction piles, suction cans]
2017/0082  . . . [Spudcans, skirts or extended feet]
2017/0086  . . . [Large footings connecting several legs or serving as a reservoir for the storage of oil or gas]
2017/0091  . . [Offshore structures for wind turbines]
2017/0095  . . [Connections of subsea risers, piping or wiring with the offshore structure]

17/02  . placed by lowering the supporting construction to the bottom, e.g. with subsequent fixing thereto
17/021  . . [with relative movement between supporting construction and platform]
17/022  . . . [adapted to travel on the bottom (walking gears moving dredgers forward step-by-step)]
17/024  . . . [shock absorbing means for the supporting construction]
17/025  . . . [Reinforced concrete structures (E02B 17/021 takes precedence)]
17/027  . . . [steel structures (E02B 17/021 takes precedence)]
17/028  . . . [Ice-structures]
17/04  . . Equipment specially adapted for raising, lowering, or immobilising the working platform relative to the supporting construction (platform lifts in general B66F 7/00)
17/06  . . for immobilising, e.g. using wedges or clamping rings ((as elements of the raising or lowering means E02B 17/08))
17/08  . . for raising or lowering
17/0809  . . . [the equipment being hydraulically actuated (outrigger for cranes B66C 23/80)]
17/0818  . . . [with racks actuated by pinions (lifting jacks B66F 3/02 - B66F 3/06)]
17/0827  . . . [with screws and nuts mechanism (climbing jacks with following nut E02B 17/0881; lifting jacks B66C 3/08)]
17/0836  . . . [with climbing jacks (climbing cranes B66C 23/32; hydraulic lifting jacks B66F 3/24 and subgroups)]
17/0845  . . . [with inflatable clamping rings]
17/0854  . . . . [with clamping wedges, eccentric clamping devices and so on (catch devices for elevators B66B 5/20, B66B 5/24, B66B 5/26)]
17/0863  . . . [with rack and pawl mechanism]
17/0872  . . . [with locking pins engaging holes or cam surfaces]
17/0881  . . . . [with following nuts]
17/089  . . . . [with subtentation blocks, feet and so on]

2201/00  Devices, constructional details or methods of hydraulic engineering not otherwise provided for
2201/02  . Devices and methods for creating a buffer zone in the water to separate, e.g. salt and sweet water
2201/04  . using old tires for hydraulic engineering