CLAIMS

1. A floating unit capable of attaching to another floating unit by locks for constructing a floating structure, said floating unit comprising:

a floating body being in the form of a hollow polygonal shape as viewed from above, wherein the floating body comprises an upper surface, a lower surface, and a plurality of lateral surfaces connected to said upper and lower surfaces,

wherein said upper surface and said lower surfaces of the floating body comprise at least one upper engaging surface and at least one lower engaging surface respectively on each associated side of said polygonal floating body, wherein the upper and lower engaging surfaces are respectively adapted in order to be fitted with a locking surface of said lock, thereby, attaching said floating body to a floating body of another floating unit, and

wherein said upper and lower engaging surfaces of said floating body respectively comprise notches, each of which has a contact surface inclined outwardly of said floating body,

wherein, in use, the corresponding contact surfaces of the notches of said upper engaging surface and the corresponding contact surfaces of the notches of said lower engaging surface are snugly in contact with the locking surfaces of said locks, thereby, attaching said floating unit to another floating unit without using fastening means,

the floating unit further comprising:

an external device installing channel, wherein the channel is in the form of a semicircular channel extended from the upper surface to the lower surface, such that the channel will facilitate connection of the external connecting device in both horizontal and vertical directions.

2. The floating unit according to claim 1, wherein said notches of said upper and lower engaging surface are in the form of an outwardly downwardly inclined indentation.

3. The floating unit according to claim 1 or 2, wherein said notch has a trapezoidal shape or a semicircular shape as viewed in a plan view.

4. The floating unit according to claim 3, wherein, as viewed from above, said notch has a semicircular shape, and said main concave portion has a semicircular shape, such that a circumference of said notch is intersected to a circumference of said main concave portion.

5. A floating unit capable of attaching to another floating unit by locks for constructing a floating structure, said floating unit comprising:

a floating body being in the form of a hollow polygonal shape as viewed from above, wherein the floating body comprises an upper surface, a lower surface, and a plurality of lateral surfaces connected to said upper and lower surfaces,

wherein said upper surface and said lower surfaces of the floating body comprise at least one upper engaging surface and at least one lower engaging surface respectively on each associated side of said polygonal floating body, wherein the upper and lower engaging surfaces are respectively adapted in order to be fitted with a locking surface of said lock, thereby, attaching said floating body to a floating body of another floating unit, and

wherein said upper and lower engaging surfaces of said floating body respectively comprise a peripheral groove and at least one radial groove communicated with said peripheral groove, in which contact surfaces of said upper engaging surface and said lower engaging surface are inclined,

wherein, in use, the corresponding peripheral grooves, radial grooves and contact surfaces of said upper engaging surface and of said lower engaging surface are contacted with the locking surfaces of said locks, thereby, attaching said floating unit to another floating unit.

6. The floating unit according to any one of the preceding claims, wherein said upper engaging surface is substantially identical to said lower engaging surface.

7. The floating unit according to claim 5 or claim 6 as appended to claim 5, wherein said groove and contact surface have a semicircle shape as viewed from above, such that the radius of the peripheral groove is larger than that of said concave portion.

8. The floating unit according to claim 5 or claim 6 or 7 as appended to claim 5, wherein said contact surface comprises a plurality of radial grooves, each being configured such that the grooves are equally radially spaced apart from each other.

9. The floating unit according to claim 8, wherein said radial grooves are respectively configured such that they are outwardly inclined.

10. The floating unit according to any one of the preceding claims, wherein the floating body further comprises a plurality of main concave portions extended between said upper engaging surface and said lower engaging surface, such that said locks can be inserted into said main concave portions.

11. The floating unit according to any one of the preceding claims, wherein said floating body is in the form of the polygonal shape selected from the group consisting of an equilateral triangle, a right isosceles triangle, a square, a rectangle, and a hexagon.

12. The floating unit according to any one of the preceding claims, wherein at least one lateral surface of the floating body further comprises at least one engaging recess and/or at least one engaging projection, such that said recess and projection are respectively extended between said upper engaging surface and said lower engaging surface, and said engaging recess is shaped in order to be snugly engaged to the engaging projection of another floating unit, so that the floating units can be attached together.

13. The floating unit according to claim 5 or any one of claims 6-12 as appended to claim 5, further comprising an external device installing channel, wherein the channel is in the form of a semicircular channel extended from the upper surface to the

lower surface, so that the channel can facilitate connection of the external device in both horizontal and vertical directions.

14. The floating unit according to any one of the preceding claims, further comprising a cylindrical unit, wherein the cylindrical unit is shaped, such that it can be fitted into said external device installing channel in order to close said channel, when it is not in use.

15. The floating unit according to any one of the preceding claims, wherein the floating body further comprises at least one hole, which is not penetrated through the wall of the floating body, on the upper surface and/or the lower surface of the floating body, such that the hole can serve as a hole for filling a material into said floating body, so that the floating unit is submerged in water as required, or the hole can serve as a hole for filling air into said floating unit, so that the floating unit is lifted up.

16. The floating unit according to any one of the preceding claims, wherein the floating body further comprises an anti-slip layer arranged on the upper surface and/or the lower surface of said floating body.

17. A floating structure comprising:

a plurality of floating units of any one of the preceding claims;

a plurality of locks by which said floating units are attached one to another, each lock comprising:

a locking rod being in the form of a cylindrical rod with at least two holes pierced through the wall of said locking rod and located adjacent to one end of said locking rod;

a lock-connecting element having a central through hole adapted for snugly inserting of said locking rod through said through hole, wherein said lock-connecting element comprises an engaging surface capable of snugly engaging with said upper engaging surface or said lower engaging surface of said floating unit;

a pair of lock-engaging elements, wherein each lock-engaging element is in the form of an arc-shaped portion capable of snugly enclosing the outside of the locking rod, and the inside of each lock-engaging element is provided with at least one latch for snugly inserting into the corresponding hole of the locking rod, while said pair of lock-engaging elements is enclosed the outside of the locking rod; and

a lock-inserting element for putting on and covering on the end of the locking rod, while the outside of the locking rod is snugly enclosed by the pair of said lock-engaging elements,

wherein, in use, an edge of each lock-engaging element is abutted on the corresponding lock-connecting element, such that the engaging surface of said lock-connecting element is locked onto said corresponding upper or lower engaging surfaces of at least two floating units together, whereby the floating units can be locked and attached together, and the floating structure can be constructed therefrom.

18. The floating structure according to claim 17, wherein said lock-engaging element further comprises a flange outwardly projected from the edge along the circumference of said lock-engaging elements for abutting with said lock connecting element.

19. The floating structure according to claim 17 or 18, wherein said lock-engaging elements further comprises at least one through hole on its side, and

said lock further comprises a lock-inserting element shaped in order to be snugly put on and cover the hole of the locking rod, and the lock-inserting element has protrusions for inserting into said corresponding through holes of said lock-engaging elements in order to fasten them together.

20. The floating structure according to claim 19, wherein said protrusion of the lock-inserting element further comprises a concave groove used for positioning, and said lock-inserting element is further provided with a button for position determination, wherein, in use, said button of said lock-inserting element is fitted into the concave groove of said protrusion of said lock-inserting element.

21. The floating structure according to claim 17, wherein said structure comprises a plurality of floating units assembled into a first floor, and a plurality of floating units assembled into a second floor vertically spaced apart from said first floor.

22. The floating structure according to claim 21, wherein said first floor is filled with a material with a density higher than that of water into the inside of said floating unit.

23. The floating structure according to any one of claims 19-22, wherein said lock-inserting element further comprises a hole on its upper portion, such that the hole is provided with internal threads for installing the external device by a screw.

24. The floating unit according to any one of claims 1 to 16, wherein said hole is provided with internal threads for closing the hole by a threaded plug.