CLAIMS

1. A method providing a stabplate connection, comprising the steps of:

(a) providing a first part comprising a stabplate and which is attached to an underwater structure;

(b) providing a second part comprising a stabplate carried by tooling;

(c) engaging the tooling with said first part;

(d) using the tooling to bring the first and second parts together so that said stabplates mate with each other;

(e) using the tooling to lock the first and second parts together by engaging a portion carried by the first part with a portion carried by the second part;

(f) disengaging the tooling from the first part; and

(g) removing the tooling from the stabplate connection.

2. A method according to claim 1, wherein said tooling has an end part which engages or disengages with said first part as a result of passing through said first and second parts.

3. A method according to claim 1 or 2, wherein said portion of the second part comprises a locking dog moved using said tooling.

4. A method according to claim 3, wherein said tooling moves a collar carried by said second part to move said locking dog, said collar comprising a bayonet fitting for being locked to or unlocked from said second part as a result of rotation of the collar.

5. A method according to claim 1 or 2, wherein said portions comprise a rotatable latching member of one of the first and second parts which engages with a latching member of the other of said first and second parts.

6. A method according to any preceding claim, wherein steps (c) to (g) are carried out using an ROV carrying said tooling.

7. A stabplate connection provided by a method according to any preceding claim.

8. A method of disconnecting a stabplate connection provided by a method according to any of claims 1 to 6, comprising the steps of:

(h) engaging such tooling with the first part;

(i) using the tooling to unlock the first and second parts from each other by disengaging said portions of the first and second parts;

(j) using the tooling to unmate the stabplates from each other; and

(k) using the tooling to remove the second part.

9. A method according to claim 8, wherein steps (h) to (k) are carried out using an ROV carrying said tooling.

10. An arrangement for providing a stabplate connection, comprising:

a first part for being attached to an underwater structure and comprising a stabplate; and

a second part comprising a stabplate carried by tooling, the arrangement being such that:

the tooling is engageable with said first and second parts;

the tooling can be used to bring the first and second parts together so that the stabplates mate with each other;

the tooling can be used to lock the first and second parts together by engaging a portion carried by the first part with a portion carried by the second part; and

the tooling is disengageable from the first part and removable from the stabplate connection.

11. An arrangement according to claim 10, wherein said tooling has an end part which is engageable with said first part as a result of passing through said first and second parts.

12. An arrangement according to claim 10 or 11, wherein said portion of the second part comprises a locking dog movable using said tooling.

13. An arrangement according to claim 12, including a collar carried by said second part, said collar being movable by said tooling to move said locking dog, said collar comprising a bayonet fitting for being locked to said second part as a result of rotation of the collar.

14. An arrangement according to claims 10 or 11, wherein said portions comprise a rotatable latching member of one of the first and second parts engageable with a latching member of the other of said first and second parts.

The invention claimed is:

1. A method providing a stabplate connection, comprising the steps of:
(a) providing a first part comprising a first stabplate and which is attached to an underwater structure;
(b) providing a second part comprising a second stabplate carried by tooling;
(c) engaging an end part of the tooling with said first part after passing the end part through said second part;
(d) using the tooling to bring the first and second parts together so that said first and second stabplates mate with each other;
(e) using the tooling to lock the first and second parts together by engaging a portion carried by the first part with a portion carried by the second part;
(f) disengaging the end part of the tooling from the first part; and
(g) removing tooling portions positioned within the second part from within said second part after disengaging the end part of the tooling, the first and the second parts remaining locked together.

2. A method according to claim 1, wherein said tooling includes an elongate locking member, wherein the end part is connected to the elongate locking member, and wherein the step of removing tooling portions positioned within the second part from within said second part includes retrieving both the end part and the elongate locking member after completing the stabplate connection.

3. A method according to claim 1, wherein said portion carried by the second part comprises a locking dog moved into a locking position using said tooling.

4. A method according to claim 3, wherein said tooling moves a collar carried by said second part to move said locking dog into a locking position, said collar comprising a bayonet fitting for locking and unlocking the mated first and second stab plates as a result of rotation of the collar.

5. A method according to claim 1, wherein said portions of the first and second parts comprise a rotatable latching member of one of the first and second parts which engages with a latching member of the other of said first and second parts.

6. A method according to claim 1, wherein steps (c) to (g) are carried out using an ROV carrying said tooling.

7. A stabplate connection provided by a method according to claim 1.

8. A method of disconnecting a stabplate connection provided by a method which comprises:

(a) providing a first part comprising a first stabplate and which is attached to an underwater structure;

(b) providing a second part comprising a second stabplate carried by tooling;

(c) engaging a portion of the tooling with said first part after passing the portion of the tooling through said second part;

(d) using the tooling to bring the first and second parts together so that said first and second stabplates mate with each other;

(e) using the tooling to lock the first and second parts together by engaging a portion of or carried by the first part with a portion of or carried by the second part to form a stabplate connection;

(f) disengaging the portion of the tooling from the first part after completing the stabplate connection; and

(g) removing tooling parts positioned within the second part after disengaging the portion of the tooling from the first part;

(h) reengaging the portion of the tooling with the first part;

(i) using the tooling to unlock the first and second parts from each other by disengaging said portion of or carried by the first part from said portion of or carried by the second part;

(j) using the tooling to unmate the first and the second stabplates from each other; and

(k) using the tooling to retrieve the second part.

9. A method according to claim 8, wherein steps (h) to (k) are carried out using an ROV carrying said tooling.

10. An arrangement for providing a stabplate connection, comprising:

a first part for being attached to an underwater structure and comprising a first stabplate;

a second part comprising a second stabplate configured to be carried by tooling;

means for bringing the first and second parts together so that the first and the second stabplates mate with each other, including portions of said tooling comprising an elongate locking member and an end part connected to the elongate locking member, and

means for locking the first and second parts together,

including means for engaging a portion carried by the second part with a portion carried by the first part; and

the tooling configured to be disengaged from the first part and to be removed from within the first and the second parts after completing the stabplate connection, with the first and second parts remaining locked together after removal of the tooling therefrom.

11. An arrangement according to claim 10, wherein the end part is engageable with said first part after being passed through said second part.

12. An arrangement according to claim 10, wherein said portion carried by the second part comprises a locking dog movable using said tooling.

13. An arrangement according to claim 12, wherein said means for locking the first and second parts together includes a collar carried by said second part, said collar being movable by said tooling to move said locking dog, said collar comprising a bayonet fitting positioned to be locked to said second part as a result of rotation of the collar.

14. An arrangement according to claim 10, wherein one of said portions carried by one of the first and second parts comprises a rotatable latching member engageable with a latching member comprised by the other of said portions carried by the other one of the first and second parts.

15. A method according to claim 1, wherein said portion carried by the second part comprises a rotatable first latching member which engages with a second latching member comprised by said portion carried by first part.

16. A method according to claim 15, wherein said second latching member comprises a locking ring contained within a housing.

17. A method according to claim 1, further comprising wherein the tooling includes:
an elongate locking member connected to the end part,
a hydraulic rotary actuator configured to rotate the elongate locking member and end part to engage the first part, and
a hydraulic linear actuator operably coupled to the elongate locking member and configured to linearly actuate the elongate locking member and end part when engaging the first part to draw the first and the second parts together; and
wherein the step of using the tooling to bring the first and second parts together comprises:
rotating the elongate locking member and end part to engage the first part using the hydraulic rotary actuator, and
linearly actuating the elongate locking member and end part when engaging the first part using the hydraulic linear actuator to thereby bring the first and second parts together.

18. A method according to claim 9, further comprising the step of returning the tooling to a surface platform after performing step (g) and prior to performing step (h).

19. An arrangement according to claim 10, wherein said portion carried by the first part comprises a first latching member, and wherein said portion carried by the second part comprises a rotatable second latching member which engages with the first latching member.

20. An arrangement according to claim 19, wherein said rotatable second latching member comprises a locking ring contained within a housing.

21. An arrangement according to claim 10, further comprising: means for retrieving the tooling from within the first and the second parts after completing the stabplate connection, with the stabplate connection remaining intact.

22. An arrangement according to claim 10,
wherein the portion carried by the first part includes a splined member;
wherein the portion carried by the second part includes a locking ring member configured to engage the splined member; and
wherein the means for locking the first and second parts together includes a clamping member circumscribing the elongate locking member and configured to rotate the splined member to engage the locking ring member.

23. An arrangement according to claim 10, wherein the means for bring the first and second parts together so that the first and the second stabplates mate with each other, comprises:
a hydraulic rotary actuator configured to rotate the elongate locking member and end part to engage the first part; and
a hydraulic linear actuator operably coupled to the elongate locking member and configured to linearly actuate the elongate locking member and end part when engaging the first part to draw the first and the second parts together.

24. A method providing a stabplate connection, comprising the steps of:
(a) providing a first part comprising a first stabplate and which is attached to an underwater structure;
(b) providing a second part comprising a second stabplate carried by tooling;
(c) engaging the tooling with said first part after passing portions of the tooling through said second part;
(d) using the tooling to bring the first and second parts together so that said first and second stabplates mate with each other;
(e) using the tooling to lock the first and second parts together by engaging a portion carried by the first part with a portion carried by the second part;
(f) disengaging the tooling from the first part; and
(g) removing tooling portions positioned within the second part from within said second part after disengaging the tooling, the first and the second parts remaining locked together, wherein steps (c) to (g) are carried out using an ROV carrying said tooling.

25. An arrangement for providing a stabplate connection, comprising:

a first part for being attached to an underwater structure and comprising a first stabplate;

a second part comprising a second stabplate configured to be carried by tooling;

a first latching member carried by one of the first and the second parts;

a rotatable second latching member carried by the other of the first and second parts and engageable with the first latching member; and

said tooling comprising:

an elongate locking member,

an end part connected to the elongate locking member,

the end part being engageable with said first part after being passed through said second part, and

a rotatable clamping member including a ring engagement member configured to be rotated to thereby cause the rotatable second latching member to engage with first latching member and to lock the first part and the second parts together;

a rotary actuator configured to rotate the elongate locking member and end part to engage the first part;

a linear actuator operably coupled to the elongate locking member and configured to linearly actuate the elongate locking member and end part when engaging the first part to draw the first and the second parts together,

the tooling configured to be disengaged from the first part and to be removed from within the first and the second parts after completing the stabplate connection, with the first and second parts remaining locked together after removal of the tooling therefrom.

26. An arrangement according to claim 25, wherein the first latching member is carried by the first part, and wherein the rotatable second latching member is carried by the second part.

27. An arrangement according to claim 26, wherein the tooling further comprises a lever connected to the clamping tool to provide for rotating the clamping tool.

28. An arrangement according to claim 26, wherein the rotatable second latching member comprises a locking ring contained within a housing.

29. An arrangement according to claim 25, wherein the first latching member is carried by the second part, and wherein the rotatable second latching member engages with the first latching member and is carried by the first part.

30. An arrangement according to claim 29, wherein the rotatable second latching member comprises a locking ring contained within a housing.

31. An arrangement according to claim 25, further comprising means for retrieving the tooling from within the first and the second parts after completing the stabplate connection, with the stabplate connection remaining intact.

32. An arrangement according to claim 25, wherein the rotary actuator is a hydraulic rotary actuator, and wherein the linear actuator is a hydraulic linear actuator.