

MODULAR RECESSED BOLLARD

BACKGROUND

Bollards or cleats are commonly used for fastening a rope to. Such cleats or bollards are often found on marine vessels such as ships barges, yachts or the like. The bollard consists of a post which is upstanding from a surface of the vessel and around which a rope can be wound sufficient times to create a secure fastening of the rope thereto.

However as the bollard is upstanding from a surface, the bollard may in certain instances be an obstruction. Should the bollard not be in use, the post can be an undesirable feature to have on a vessel. Ropes can get snagged around the post, people can walk into the post and where the bollard is provided at deck level, the bollard consumes deck space which for certain vessels may be valuable space which could alternatively be utilised for storage. Accordingly there have been developments to bollards where the post is retractable. With reference to for example US patent 5983820 there is shown a cleat which can move from an operative condition to a stored condition. In the stored condition the cleat sits substantially flush with the surface of the deck. The cleat of US 5983820 moves in a purely linear direction between the operative and stored condition. Components such as springs and ball bearings are used to hold the cleat in the two conditions.

With reference to US 4672909 there is shown a retractable cleat which moves between the stored and operative conditions by a combination of linear as well as rotational movement. The cleat moves relative to the housing in a linear fashion but is rotated at some point between the stored and operative condition to move a pin to a location where it can rest on a surface to thereby hold the cleat in the operative position.

The housing with which the cleat moves is a housing which has been cast and machined to provide a pathway within which the pin of the cleat moves between the operative and stored condition. The manufacture of the housing is hence complex and involves a casting and subsequent machining of material to provide the effective features.

Accordingly it is an object of the present invention to provide a modular recessed bollard which is able to be fabricated and thereby of a simple to create constructions or to at least provide the public with a useful choice

BRIEF DESCRIPTION OF THE INVENTION

In a first aspect the present invention consists in a modular bollard comprising a housing engagable to a deck of a marine vessel and to located below deck level of said deck, said housing including an opening locate at said deck level

an elongate bollard member including a lower stem section and an upper tie-off section,

said bollard member located with said housing and adapted to be moved relative thereto in the elongate direction between a stored condition wherein said upper tie-off section is retracted within said housing and below deck level and an operative condition wherein said bollard member extends through said opening to present said upper tie-off section above said deck level,

at least one projection extending outwardly from said stem section

a support surface within said housing which is non parallel to the elongate direction

said bollard member being rotatable relative to said housing about an axis of rotation parallel to said elongate direction, such that in at least one rotational orientation of said bollard member the at least one projection can rest on said support surface and in a rotational orientation of said bollard member other than said at least one rotational orientation, the projection can move in said elongate direction to be positioned at least in part below said support surface

said at least one projection of said stem section being provided at a distance along said stem section such that when the at least one projection rests on said support surface said bollard member is in the operative condition and when said at least one projection is at least in part below said support surface said bollard member is in said stored condition.

Preferably said support surface is planar.

Preferably said housing provides the support surface as part of a support plate positioned in a direction lateral to said elongate direction said support surface facing upwardly therefrom.

Preferably said at least one projection provides a downward facing surface of a complementary shape to the support surface where said projection is to engage when said bollard member is in said at least one rotational orientation.

Preferably said downward facing surface is positioned below said support surface when said bollard is in the other than said at least one rotational orientation.

Preferably said housing includes an elongate direction extending perimeter wall which in-situ will extend from or proximate to said deck level in a downward direction.

Preferably said perimeter wall has a cover member engaged at the top thereof to be positioned at substantially deck level and by which said first mentioned opening to said housing is defined.

Preferably said first mentioned opening is of a size to allow for said upper tie-off section to move therethrough in said elongate direction, when said bollard member is in said other than said at least one rotational orientation.

Preferably said first mentioned opening is of a perimeter shape which will provide support against said bollard member in at least some directions lateral to said elongate direction.

Preferably said perimeter is of complementary shape to the largest cross sectional shape (transverse to the elongate direction) of that section of said bollard member to pass through said first mentioned opening.

Preferably said support plate is engaged to said perimeter wall of said housing.

Preferably said support plate is located at the bottom of said housing.

Preferably said support plate is located internal of said housing.

Preferably said perimeter wall extends to a bottom cover positioned below said support plate.

Preferably said bottom cover is a distance below said support plate sufficient to allow for the lower stem section to move theretowards to retract said bollard member to said stored condition.

Preferably the bottom cover defines an opening to said housing through which any water entering the housing can drain.

Preferably said stem section rests on said bottom cover when said bollard member is in said stored condition.

Preferably said housing includes at least one upstand which prevents rotation of said bollard member in one rotational direction from the at least one rotational orientation when said bollard member is in said operative condition.

Preferably said housing can receive a pin therewith which when said bollard member is in said operative condition and in said at least one rotational orientation, said at least one projection is captured between said upstand and said pin.

Preferably said at least one projection extends radially to the axis of rotation of and from said stem section

Preferably said at least one projection is a flange.

Preferably said at least one projection is a rod.

Preferably at least two projections are provided.

Preferably two projections are provided extending radially from said stem in diametrically opposite directions.

Preferably said housing provides a support surface for each of said at least two projections.

Preferably said housing includes two upstands each which prevent rotation of said bollard member in one rotational direction beyond the at least one rotational orientation when said bollard member is in said operative condition, by being engagable by said at least two projections.

Preferably said upper tie-off section and said lower stem section are cylindrical members

Preferably said upper tie-off section and said lower stem section are coaxial cylindrical members.

Preferably said bollard member includes a single cylindrical section defining said upper tie-off section and said lower stem section.

Preferably said upper tie-off section includes a securing means.

Preferably said securing means is a transverse member engaged and extending laterally to said upper tie-off section.

Preferably said securing means is a transverse member engaged and extending laterally through said upper tie-off section.

Preferably said upstand(s) is a flange which is engaged to said support surface

Preferably said upstand is engaged to said perimeter wall and positioned above said support surface.

In a second aspect the present invention consists in a modular bollard comprising a housing which defines at least one cavity, said cavity including a first and second opening which are provided through opposing walls of said cavity

an elongate bollard member including a lower stem section and an upper tie-off section, said elongate bollard member located with said housing and adapted to be moved in the elongate direction between a stored condition wherein said upper tie-off section is retracted within said cavity and an operative condition wherein said upper tie-off section extends through said first opening,

wherein the relationship between the shape of the second opening and the stem section is such that the stem section can pass through said opening in at least one rotational orientation thereof relative to said housing and about axis parallel to said elongate direction and when said bollard member is in said operative condition is prevented from passing therethrough when in at least one other rotational orientation relative to said housing and about said axis at least.

Preferably said relationship is established by a complementary lock and key shape of said second opening and said lower stem section.

This invention may also be said broadly to consist in the parts, elements and features referred to or indicated in the specification of the application, individually or collectively, and any or all combinations of any two or more of said parts, elements or features, and where specific integers are mentioned herein which have known equivalents in the art to which this invention relates, such known equivalents are deemed to be incorporated herein as if individually set forth.

BRIEF DESCRIPTION OF THE DRAWINGS

Figure 1 is a sectional view through a modular bollard of the present invention through section XX of Figure 5, showing the bollard member in an operative condition,

Figure 2 is a front view of a bollard member of the present invention,

Figure 3 is a side view of Figure 2,

Figure 4 is a plan view of Figure 1 but wherein the bollard member is in a stored condition,

Figure 5 is a plan view of Figure 1,

Figure 6 is a front view of the housing of the modular bollard,

Figure 7 is a side view of Figure 6,

Figure 8 is a sectional view through section B of Figure 10,

Figure 9 is a plan view of Figure 6,

Figure 10 is a sectional view through section A of Figure 6,

Figure 11 is a cut away view of part of a modular bollard of the present invention,

Figure 12 is a sectional view of part of a modular bollard,

Figure 13 is a sectional view of an alternative configuration of a modular bollard,

Figure 14 is a sectional view of yet an alternative embodiment of a bollard,

Figure 15 is a cut away perspective view of the housing of a modular bollard,

Figure 16 is a plan and partially cut away view of a modular bollard,

Figure 17 illustrates an alternative configuration to Figure 16,

Figure 18 illustrates an alternative configuration to Figure 16,

Figure 19 illustrates an alternative configuration to Figure 16.

DETAILED DESCRIPTION OF THE INVENTION

With reference to Figure 1 there is shown a modular bollard 1 in an operative condition. The modular bollard comprises a housing 2 and a bollard member 3. The housing 2 is able to be engaged to a part of a vessel such as for example a deck by cutting a hole in the deck surface and engaging the housing with said hole. Most preferably the housing (as for example shown in Figure 1) does not protrude above deck level 4 although some parts of the housing may extend slightly above deck level. orientations of

the bollard member relative to the housing. Most preferably the housing is a fabricated housing.

In the preferred form and as the object of a recessed bollard is to remove substantially all obstruction at deck level when the bollard is in a stored condition, the housing is substantially flush with the deck at deck level. The housing is preferably made from a sheet or plate material such as steel. The housing is preferably fabricated by welding steel plate together to, for example with reference to Figure 5, define a housing which is of a perimeter which is rectangular or square when viewed in plan. However with reference to for example Figure 19, the housing may be of any other perimeter shape such as for example a circular (cylindrical) shape. The housing extends from deck level where it is engaged to the vessel, downwardly to a distance which is below deck level. The housing may be attached to the vessel at other points. Attachment may for example be by welding or where the housing is of a composite material, by the use of a resin. Alternatively or additionally the housing may include flanges which can be utilised for the engagement of fastening means such as bolts or screws to fasten the housing to the deck. This alternative or additional means of fastening has not been shown.

Engaged with the housing is a bollard member 3. A bollard member is a generally elongate member and is for example of a cylindrical shape. With reference to Figures 2 and 3, it can be seen that the bollard member is elongate in direction L. Whilst the bollard member is shown to comprise a single cylindrical member to define the body thereof, it can be made up of several cylindrical members and indeed the members need not be circular in cross section. The bollard member itself includes a lower stem section 5 and an upper tie-off section 6. Although intermediate sections may be placed between sections 5 and 6, in the most preferred form these sections are immediately juxtaposed. The upper tie-off section is that section of the bollard member with which a rope can engage when the modular bollard is in an operative condition. The upper tie-off section may for example include a securing means 7 which is an additional feature with which a rope can engage. The securing means may for example be a rod which extends through the upper tie-off section in a direction substantially lateral to the elongate or longitudinal direction L. Such a transverse member is common in bollards. Alternative configurations of the upper tie-off sections may be provided.

The bollard member is movable relative to said housing in a rotational direction about an axis of rotation R which is substantially parallel to the elongate direction L. The lower stem section is of a nature which at some point along the stem section in the elongate direction, in cross section is not symmetrical about all planes extending through and along the axis R. In other words at some point along the stem section the bollard member is not of a circular cross section when the cross section is taken lateral to the direction of the axis R. In the most preferred form such a non circular cross section is provided by at least one projection 8 which extends from the stem section. As can be seen in Figure 2 most preferably there are two projections provided which extend from the lower stem section in substantially diametrically opposite directions. The projections are for example flanges which have been welded to the stem section. Alternatively the projections may be a rod and may for example be of a nature like the securing means 7 which is engaged to the upper tie-off section. In yet another configuration, the lower stem section may itself be of a cross sectional shape which is non circular and thereby itself provide such a projection. The lower stem section may for example be of a square cross section.

The projection 8 includes a lower facing surface 9 which is to engage with an upward facing surface 10 of the housing when the modular bollard is in an operative condition. With reference to Figure 15, this surface 10 is positioned within said housing and is preferably provided by a plate which extends from the perimeter 11 of the housing. The surface 10 may be provided by a plate or other add on extension of said housing and which is located within the perimeter 11 of the housing 1. The plate 12 provides an upwardly facing surface 10 onto which the downwardly facing surface 9 of the projection can engage. When the two surfaces are in contact with each other, the bollard member will be prevented from moving in the direction of engagement. Such prevention of movement will support the modular bollard member against the forces of gravity and hold the bollard member in a fixed position relative to the housing. Such a fixed position relative to the housing is such that the upper tie-off section is projected above the deck level 4. The surface 10 is a surface, the normal of which is projected in a direction which is not perpendicular to the elongate direction L. In the preferred form as shown in Figures 12 and 13 for example, surface 10 has a normal which is substantially parallel to the

elongate direction. Alternatively and with reference to Figure 14 the normal of the surface 10 is at an inclined angle to the elongate direction.

In a form where the bollard member includes two projections as for example shown in Figures 11-14 and 16-18, two such surfaces 10 may be provided extending from the perimeter 11 of the housing. Where two such surfaces are provided they are both engagable by a respective projection. Engagement by the projection of the bollard member with the surface occurs when the bollard member is in a certain rotational orientation relative to the housing. This rotational orientation (which may be a range of angles or a fixed angle) about the axis R will allow the bollard member to be supported when in a position extending relative to the housing to locate the upper tie-off section in the operative condition above deck level. The surface 10 provides an obstruction to the movement of the bollard member when in such a rotational orientation from moving in a downward direction to retract the upper tie-off section within the housing. The distance between the surface 10 and deck level is such that movement of the bollard member in the elongate direction from the stored condition to the operative condition, will place the tie-off section at a sufficient height above deck level.

The bollard member can be rotated to a rotational position other than the first mentioned rotational position(s) and wherein, in such other rotational position no surface of the housing will provide obstruction to the movement of the bollard member in a downward direction towards the storage position. The surface 10 must hence at least provide an opening in the longitudinal direction of or through said housing which is of a shape complimentary (and slightly larger) than the cross sectional shape of the stem section at a region where said projection is provided. With reference to Figure 16, it can be seen that a plate 12 is provided with an opening 13 which is of a slightly larger shape and profile to the cross sectional shape of the lower stem section and the flanges extending therefrom. By rotating the bollard member from the position as shown in Figure 16 where the projections are resting on the surface 10 to become aligned with the opening 13, the bollard member needs to be rotated through substantially 90 degrees. At a rotation of 90 degrees the projections become aligned with corresponding regions of the opening 13 through which the projections can then pass to allow for the bollard member to move vertically downwards and to place the bollard member in a stored condition.

Rotation between the rotational condition of the bollard member where it is supported on the surface 10 to a rotational condition where the bollard member can move vertically downwards, need not be through 90 degrees. It can be seen with reference to Figure 17 that the rotational angle can be less. The rotational angle can also be more.

Figure 18 illustrates the fact that the surface 10 need not be provided by a plate 12 which covers the entire cross sectional area within the housing save for an opening 13 similar in shape to the cross-section of the stem. A plate merely sufficient to provide the support surface 10 may be provided, the remainder of the cross sectional area of the housing in the longitudinal direction being opened for passage of the projections when they are moved in the vertical direction.

Figure 19 illustrates that the plate member 12 may be circular and include a region 15 of the opening 13 through which a single projection of the stem section can pass.

The plate 12 may define the bottom of the housing as for example shown in Figure 14. The lower stem section can pass downward beyond the lower plate 12 to be positioned below the housing when the bollard member is in the stored condition. However in the preferred form the bollard member in the stored condition is retained entirely within the housing. The perimeter wall 11 of the housing hence extends below the plate 12 providing the surface 10. As can be seen with reference to Figures 15 and 6-8, the housing extends downwards towards a bottom surface member 14. The distal end 16 of the bollard member will sit short of or sit on the lower bottom surface member 14 when the bollard member is in the retracted (stored) condition. The bottom surface may include an opening 17 which is a drainage hole through which any water entering the housing can drain. The drainage hole may for example be connected to a drainage pipe 18 to channel the flow of drained water out from said housing towards a discharge region which may for example be outward from the hull of the vessel.

The housing may also include an upper cover plate 20 which is substantially flush with the deck at deck level. The cover plate 20 provides an opening 21, through which the upper tie-off section can pass when moving from the stored condition to the operative condition. The opening 21 is preferably of a shape which is complementary to the largest cross sectional shape of the upper tie-off section. The plate 20 preferably provides the opening 21 in a form which includes (a) arcuate regions which are of a size slightly larger

than the diameter of the cylindrical upper tie-off section and (b) regions extending from the arcuate regions which define an opening shape through which for example the securing means 7 can pass. The arcuate regions are of a size sufficient to allow for the bollard member in the appropriate elevation to remain rotational relative to the housing. Should this upper tie-off section be of a non circular cross section then the opening will need to be sufficiently large to allow for rotation of the bollard member relative to the housing. However with the provision of a circular cross section of the upper tie-off section the opening 21 can provide a significant degree of support to the bollard member in a direction lateral to the elongate direction. Such support is provided by engagement of the bollard member with the perimeter of the opening at the arcuate regions and when such engagement occurs, no further displacement of the bollard member relative to the housing in that particular direction can occur. Support against movement in the lateral direction may also be provided by the opening 13 of the plate 12 in a similar manner. With reference to Figure 1, it can be seen that some part of the lower stem section remains extending below the surface 10 and extends through the opening 13 of the plate 12. Similarly arcuate sections 22 of the opening 13 can be seen with reference to Figure 1.

The upper tie-off section may include a cap 25. The opening 21 of the upper plate as shown in Figure 9 is hence with arcuate sections 27 which are larger than the diameter of the cylindrical section of the bollard member. The arcuate sections 27 will still provide lateral support to the bollard member but of a less tight fit than were they of a radius more proximate to the diameter of the cylindrical section. It may however be that the opening 21 need not be of a size pass the cap 21 and the cap may sit slightly above deck level. Alternatively the plate 20 may have a rebate therein into which the cap 25 can sit.

With reference to Figures 9, 10 and 11 it can be seen that internal of the housing there is provided an upstand 28. This upstand 28 preferably stands from the internal surface of the perimeter wall 11 and inwardly towards the bollard member. The upstand 28 is preferably a flange as for example shown in Figure 11. This flange extends sufficiently enough into the cavity of the housing so that when the bollard member is in a first rotational position and supported on the surface 10, the projection 8 can locate against the upstands 28. In locating against the upstands 28 the bollard member is

prevented from rotating in the direction of engagement. In the example shown in Figure 11 and in the most preferred form of the present invention where two projections 8 are provided extending from the stand section, correspondingly two upstands 28 are provided. Each upstand is to engage with a respective projection at one rotational orientation of the bollard member relative to the housing. The direction of engagement between the projections and the two upstands is in the same rotational direction. Once engagement occurs further rotation in the engagement direction of the bollard member is prevented. The upstands 28 are preferably flanges which may extend between the plate 12 and plate 20. However they need only be of a height sufficient such that when the projections 8 are supported on the surface 10, will also simultaneously be engagable against the upstands 28. With reference to Figure 13 (and although the upstands 28 are now shown) the projections 8 need not extend the full height of the cavity of the housing between the plate 12 and 20. Indeed separate projections to prevent rotation may be provided from the stem section to those projections 8 providing for vertical support.

When the bollard member is in an operative condition, rotation of the bollard member is preferably locked. Such locking is for example achieved by the use of a pin 30 which can be engaged with the housing and to extend into the housing to locate in a region wherein the projection 8 of the stem section is trapped between the pin and the upstands 28. The pin 30 is preferably movable through an opening 31 of the plate 20 and also able to extend through an opening 32 of the plate 12. The openings are preferably aligned so that the pin will extend substantially parallel to the elongate direction when engaged with the housing to trap the projection 8. The pin 30 is preferably insertable with the housing through the plate 20 and then through the plate 12 and thereby is prevented from moving in a direction lateral to the elongate direction. The pin can be removed from the housing when it is desirable to rotate the bollard member to for example rotate it to allow to be stored.

The pin can be engaged with the housing in a storing position by inserting it through separately provided openings 33, 34 of the plate 20 and plate 12. A head 35 of the pin may in the stored position extend above deck level or may be provided within a rebate of the plate 20. If in a stored position where the head 35 extends above the deck level, some upstands from the upper surface of the plate 20 may be provided. Such

upstands 36 may be provided to prevent the pin from being damaged by any solid objects moving across the surface or may prevent for example a person tripping up over the head of the pin. The upstands 36 may be provided with a sloping surface to allow for objects to roll over the upstands.

In the configuration as for example shown in the most preferred form where two projections 8, 9 are provided, correspondingly two pins are engagable with the housing to trap the respective projections with respective upstands when the bollard member is in an operative condition.

The stem section may also be provided with a region of increased diameter at or towards its distal end. Such a region 40 may be provided by a disk or bar. The disk or bar is of a size which prevents the bollard member from being withdrawn from the housing and is of a size which cannot pass through the opening 13, or at least not in most rotational

CLAIMS :

1. A modular bollard comprising
 - a housing engagable to a deck of a marine vessel and to located below deck level of said deck, said housing including an opening locate at said deck level
 - an elongate bollard member including a lower stem section and an upper tie-off section,
 - said bollard member located with said housing and adapted to be moved relative thereto in the elongate direction between a stored condition wherein said upper tie-off section is retracted within said housing and below deck level and an operative condition wherein said bollard member extends through said opening to present said upper tie-off section above said deck level,
 - at least one projection extending outwardly from said stem section
 - a support surface within said housing which is non parallel to the elongate direction
 - said bollard member being rotatable relative to said housing about an axis of rotation parallel to said elongate direction, such that in at least one rotational orientation of said bollard member the at least one projection can rest on said support surface and in a rotational orientation of said bollard member other than said at least one rotational orientation, the projection can move in said elongate direction to be positioned at least in part below said support surface
 - said at least one projection of said stem section being provided at a distance along said stem section such that when the at least one projection rests on said support surface said bollard member is in the operative condition and when said at least one projection is at least in part below said support surface said bollard member is in said stored condition,
 - wherein said housing provides the support surface as part of a support plate positioned in a direction lateral to said elongate direction said support surface facing upwardly therefrom.
2. A modular bollard as claimed in claim 1 wherein said support surface is planar.

3 A modular bollard as claimed in any one of claims 1 to 2 wherein said at least one projection provides a downward facing surface of a complementary shape to the support surface where said projection is to engage when said bollard member is in said at least one rotational orientation.

4 A modular bollard as claimed in claim 3 wherein said downward facing surface is positioned below said support surface when said bollard is in the other than said at least one rotational orientation.

5 A modular bollard as claimed in any one of claims 1 to 4 wherein said housing includes an elongate direction extending perimeter wall which in-situ will extend from or proximate to said deck level in a downward direction.

6 A modular bollard as claimed in claim 5 wherein said perimeter wall has a cover member engaged at the top thereof to be positioned at substantially deck level and by which said first mentioned opening to said housing is defined.

7 A modular bollard as claimed in any one of claims 1 to 6 wherein said first mentioned opening is of a size to allow for said upper tie-off section to move therethrough in said elongate direction, when said bollard member is in said other than said at least one rotational orientation.

8 A modular bollard as claimed in any one of claims 1 to 7 wherein said first mentioned opening is of a perimeter shape which will provide support against said bollard member in at least some directions lateral to said elongate direction.

9 A modular bollard as claimed in any one of claims 1 to 8 wherein said perimeter is of complementary shape to the largest cross sectional shape (transverse to the elongate direction) of that section of said bollard member to pass through said first mentioned opening.

10. A modular bollard as claimed in claim 5 or 6 wherein said support plate is engaged to said perimeter wall of said housing.

11. A modular bollard as claimed in any one of claims 2 to 10 wherein said support plate is located at the bottom of said housing.

12. A modular bollard as claimed in any one of claims 2 to 10 wherein said support plate is located internal of said housing.

13. A modular bollard as claimed in claim 5 wherein said perimeter wall extends to a bottom cover positioned below said support plate.

14. A modular bollard as claimed in claim 13 wherein said bottom cover is a distance below said support plate sufficient to allow for the lower stem section to move theretowards to retract said bollard member to said stored condition.

15. A modular bollard as claimed in any one of claim 13 or 14 wherein bottom cover defines an opening to said housing through which any water entering the housing can drain.

16. A modular bollard as claimed in any one of claims 13 to 15 wherein said lower stem section rests on said bottom cover when said bollard member is in said stored condition.

17. A modular bollard as claimed in any one of claims 1 to 16 wherein said housing includes at least one upstand which prevents rotation of said bollard member in one rotational direction from the at least one rotational orientation when said bollard member is in said operative condition.

18. A modular bollard as claimed in claim 17 wherein said housing can receive a pin therewith which when said bollard member is in said operative condition and in said at least one rotational orientation, said at least one projection is captured between said upstand and said pin.

19. A modular bollard as claimed in any one of claims 1 to 18 wherein said at least one projection extends radially to the axis of rotation of and from said stem section

20. A modular bollard as claimed in any one of claims 1 to 19 wherein said at least one projection is a flange.

21. A modular bollard as claimed in any one of claims 1 to 19 wherein said at least one projection is a rod.

22. A modular bollard as claimed in any one of claims 1 to 21 wherein at least two projections are provided.

23. A modular bollard as claimed in any one of claims 1 to 22 wherein two projections are provided extending radially from said stem in diametrically opposite directions.

24. A modular bollard as claimed in any one of claim 22 or 23 wherein said housing provides a support surface for each of said at least two projections.

25. A modular bollard as claimed in any one of claims 22 to 24 wherein said housing includes two upstands each which prevent rotation of said bollard member in one rotational direction beyond the at least one rotational orientation

when said bollard member is in said operative condition, by being engagable by said at least two projections.

26. A modular bollard as claimed in any one of claims 1 to 25 wherein said upper tie off section and said lower stem section are cylindrical members

27. A modular bollard as claimed in any one of claims 1 to 26 wherein said upper tie off section and said lower stem section are coaxial cylindrical members.

28. A modular bollard as claimed in any one of claims 1 to 25 wherein said bollard member includes a single cylindrical section defining said upper tie-off section and said lower stem section.

29. A modular bollard as claimed in any one of claims 1 to 28 wherein said upper tie off section includes a securing means.

30. A modular bollard as claimed in claim 29 wherein said securing means is a transverse member engaged and extending laterally to said upper tie-off section.

31. A modular bollard as claimed in claim 29 wherein said securing means is a transverse member engaged and extending laterally through said upper tie-off section.

32. A modular bollard as claimed in claim 17 wherein said upstand(s) is a flange which is engaged to said support surface

33. A modular bollard as claimed in claim 17 wherein said upstand is engaged to said perimeter wall and positioned above said support surface.

34. A modular bollard comprising
a housing which defines at least one cavity, said cavity including a first and second opening which are provided through opposing walls of said cavity
an elongate bollard member including a lower stem section and an upper tie off section, said elongate bollard member located with said housing and adapted to be moved in the elongate direction between a stored condition wherein said upper tie-off section is retracted within said cavity and an operative condition wherein said upper tie-off section extends through said first opening,

wherein the relationship between the shape of the second opening and the stem section is such that the stem section can pass through said opening in at least one rotational orientation thereof relative to said housing and about axis parallel to said elongate direction and when said bollard member is in said operative condition is prevented from passing therethrough when in at least one other rotational orientation relative to said housing and about said axis at least.

35. A modular bollard as claimed in claim 34 wherein said relationship is established by a complementary lock and key shape of said second opening and said lower stem section.