

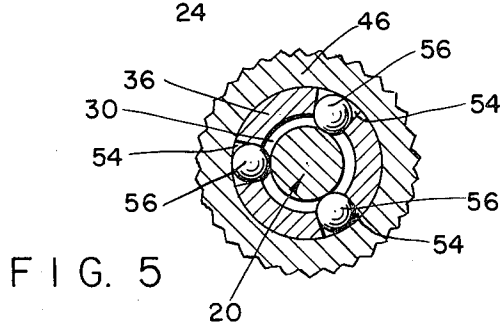
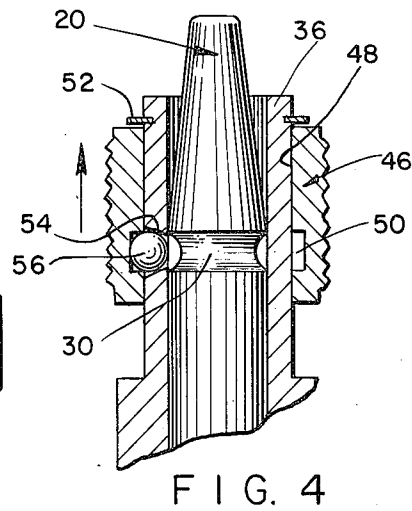
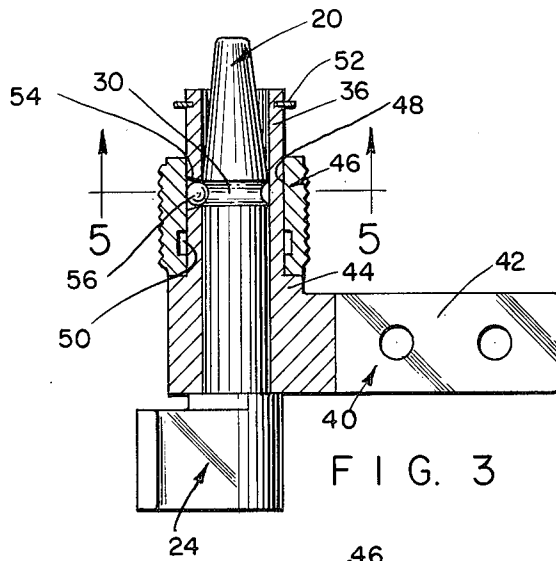
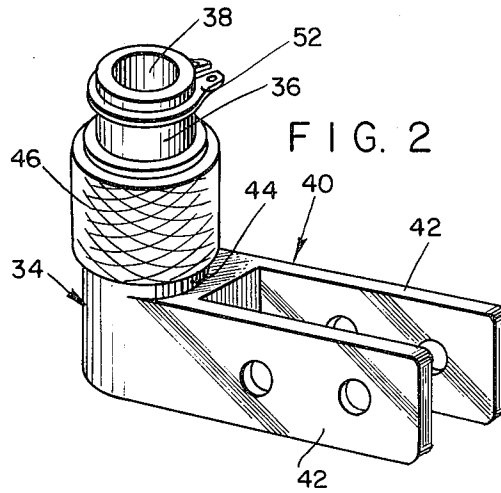
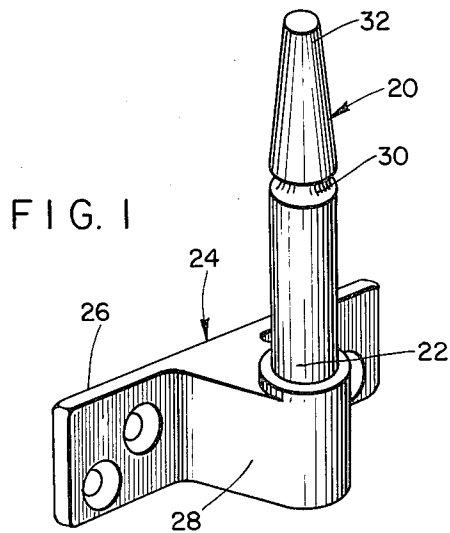
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GUDGEON AND PINTLE

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GUDGEON AND PINTLE

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This invention relates to marine hardware and more particularly to a novel pintle and gudgeon assembly.

In small marine craft such as center-board sail boats and the like, the rudder is usually removably mounted by a pintle and gudgeon arrangement. The latter generally is clamped or affixed to the rudder, and in such event the pintle is then mounted on the vessel's stern. Since the rudders of this type of small craft are frequently controlled only through a hand-operated tiller, it is customary to unship the rudder and stow it inboard whenever the craft is to be moored for a period of time. This insures that heavy weather will not damage the rudder or its support. Because rudders of this type are generally made of wood or other lightweight material in order to reduce the burden each time the rudder is installed or removed, such rudders are buoyant. Thus, in a following sea, wave action will sometimes cause a rudder to float upwardly, separating the rudder linkage and resulting in a loss of the rudder or worse.

Attempts have been made to solve this problem. For example, a rudder pintle has been made with a key and the gudgeon with a keyway such that the two are aligned only when the rudder is hard over; otherwise sliding movement of the gudgeon along the pintle is obstructed. However, for well known reasons, pintles are usually made of metals such as marine bronze, brass and the like. Such metals are comparatively soft and cannot, in the form of a small bar or key, readily withstand shear, such as is imposed by a typical twenty pound rudder when moving upwardly in response to wave action.

A principal object of the present invention is to provide a novel pintle and gudgeon assembly for boat's rudders, which assembly satisfactorily solves these problems in that the two main components are readily separable, but only by a positive act of an individual which unlocks a normally engaged assembly.

Other objects are to provide such an assembly which is simple and inexpensive to manufacture, requires little if any maintenance, which provides a positive locking engagement, and the components of which cannot be ordinarily separated or unlocked by the usual forces of wind and water acting upon a rudder; and to provide such an assembly comprising a cylindrical pintle affixed at one end to means for mounting the pintle at the stern of a vessel, the pintle having an annular recess or groove disposed intermediate its ends, a gudgeon having a rudder and mounting portion and a first tubular element dimensioned to fit for slidingly rotatable and axial movement about the pintle, engagement means moveable to a limited extent into the interior of the tubular element so as to extend into the annular groove about the pintle when the latter is disposed in a predetermined position within the tubular element, a second tubular element disposed concentrically with respect to the exterior of the first tubular element and being axially moveable with respect to the first element, the second element having an interior annular groove into which the engagement means are moveable out of the interior of the first element when the second element is in a predetermined position, and the second element being dimensioned across the remainder of its interior so as to retain the engagement means in extended position into the annular groove in the pintle whenever the second element is not in its predetermined position.

Other objects of the invention will in part be obvious and will in part appear hereinafter. The invention accordingly comprises the apparatus possessing the construction, combination of elements, and arrangement of parts which are exemplified in the following detailed disclosure, and the scope of the application of which will be indicated in the claims.

For a fuller understanding of the nature and objects of the present invention, reference should be had to the following detailed description taken in connection with the accompanying drawings wherein:

FIG. 1 is a perspective view of an exemplary pintle embodying the principles of the present invention;

FIG. 2 is a perspective view of an exemplary gudgeon embodying the principles of the present invention;

FIG. 3 is a view, partly in cross-section taken across the gudgeon, of an assembly of the pintle and gudgeon of FIGS. 1 and 2, showing the two main elements locked together;

FIG. 4 is an enlarged detail of a portion of the view of FIG. 3 showing the position of certain parts when the two main elements are unlocked; and

FIG. 5 is a cross-section taken along the line 5—5 of FIG. 3.

Referring now to the drawing, there is shown in FIG. 1 a pintle formed according to the principles of the present invention and comprising first elongated cylindrically shaped element 20 affixed at one end 22 to means, such as bracket 24, for mounting element 20 on a vessel in an erect position. Bracket 24 is typically T-shaped, top 26 of the T being formed, for example, of substantially flat stock or cast in flat form and drilled in a number of places to accept mounting screws. Stem 28 of the T preferably is also formed of thick flat stock or is cast extending perpendicularly to the plane of top 26, the base of stem 28 supporting element 20 substantially in the plane of and normally to the long dimension of top 26.

Element 28 includes, intermediate its ends, circumferential annular recess 30 preferably having a semicircular cross-section. End 32 of element 28 opposite to end 22 is preferably rounded or tapered.

Referring now to FIG. 2, there is shown a gudgeon formed according to the principles of the present invention and comprising second substantially cylindrical element 34 having a portion or tube 36 thereof of substantially uniform outside diameter. Element 34 also includes coaxial cylindrical channel 38 therein, the latter being open at least at one end of element 34 and having an interior diameter only sufficiently greater than the maximum diameter of element 20 such that the latter can slidingly fit into the channel. Element 34 is mounted at the bight of U-shaped bracket 40, the arms 42 of which extend substantially parallel to one another and perpendicularly to the long axis of element 34. Both arms 42 are formed of substantially flat stock or cast, and are drilled to permit insertion of screws therethrough for affixing the bracket firmly to a rudder placed between the arms. Adjacent the bight of the bracket, element 34 has portion 44 thereof with an outside diameter greater than the outside diameter of tube 36 which extends therefrom.

Mounted about tube 36 is third substantially cylindrical element 46, having a length somewhat lesser than the length of tube 36. As shown in FIG. 3, element 46 includes coaxial cylindrical interior or channel 48 having generally a diameter sufficiently greater than the outside diameter of tube 36 so that element 46 can be axially moveable with respect to tube 36. Element 46 has annular groove 50 formed about the interior circumference of channel 50, preferably lying in a plane normal

to the cylindrical axis of the channel and disposed intermediate its ends.

All parts of both pintle and gudgeon are preferably of a heavy, corrosion resistant metal such as naval-bronze or the like. Inasmuch as element 46 is preferably taken thick-walled, it has substantial weight and thus, when element 34 is erect, as will occur when a rudder attached thereto is vertical, element 46 will be held by gravity against portion 44. The latter then constitutes a first limit stop of the axial excursion of element 46 along tube 36. The latter is provided at its other end with another limit stop for element 46, as in the form of snap ring 52. It will be appreciated that, in the form shown, element 46 is then normally biased against the first limit stop and is manually moveable toward snap ring 52. Alternatively, of course, element 46 could be normally spring-biased against ring 52 and thus manually moveable toward portion 44. The latter structure, however, requires the addition of a spring and is therefore not as simple as the structure shown in the drawing.

It will also be seen in FIGS. 3 and 5 that tube 36 includes at least one and preferably more approximately coaxial openings 54 extending from the exterior thereof in a decreasing taper toward and into channel 38. Openings 54, when more than one in number, are preferably disposed equiangularly about and with their own long axes lying substantially in the same place perpendicular to the cylindrical axis of channel 38 intermediate the end of tube 36. Disposed within each of openings 54 is a corresponding engagement means in the form of sphere 56. The narrower end of each opening 54 is somewhat lesser in diameter than the diameter of its corresponding sphere, thus allowing the latter to be positioned such that a portion thereof can only protrude into channel 38 without being able to slip wholly out of its opening and into the channel. The outside and inside diameters of tube 36 are preferably such that each sphere is substantially tangent to a given plane across the larger end of its opening 54. It will be apparent that such given planes are approximated by that part of the interior wall of cylindrical element 46 at least adjacent to groove 50.

Groove 50 is disposed such that when element 46 is in its normal or locking position in engagement with portion 44, the groove is axially displaced from a position wherein it is across the openings as shown in FIG. 3. In this circumstance, the spheres are held in position wherein they project into channel 38. If the pintle and gudgeon are engaged such that element 20 is disposed in channel 38 with recess 30 extending across the smaller ends of openings 54, then the locking position of element 46 insures that the spheres will be held such that they must project into recess 30. Relative axial movement of the pintle and gudgeon is thus positively prevented by engagement of spheres 56 with the wall of the recess. Force exerted on bracket 40 along the axis of element 34, as would occur for example from a following sea lifting a rudder attached to such a bracket, cannot normally disengage the gudgeon from the pintle.

However, as shown in FIG. 4, the gudgeon can be manually disengaged from the pintle simply by axially sliding element 46 toward its unlocking position adjacent to snap ring 52, wherein preferably groove 50 is positioned across the larger ends of openings 54. As shown, this permits the spheres to move or be moved along openings 54 and partly into groove 50, at least sufficiently so that they no longer project into channel 38 and thus cannot prevent relative axial motion of the pintle and gudgeon.

Since certain changes may be made in the above apparatus without departing from the scope of the invention herein involved it is intended that all matter contained in the above description or shown in the accompanying drawing shall be interpreted in an illustrative and not in a limiting sense.

What is claimed is:

1. An assembly for releasably mounting a rudder on a boat, said assembly comprising, in combination, an elongated cylindrical pintle having one end affixed to means extending substantially normally to and adjacent one end of said pintle for mounting said pintle on said boat in an erect position, said pintle having an engagement portion disposed intermediate its ends;
- a gudgeon having an elongated cylindrical channel therein and including means extending outwardly from said gudgeon substantially normally of the axis of said channel for coupling said gudgeon to said rudder;
- said channel having at least one opening in the wall thereof intermediate its ends;
- said gudgeon including engagement means moveable between a first position wherein said engagement means projects through said opening into said channel so as to be engageable with said engagement portion when said pintle is disposed in a predetermined position in said channel, and a second position wherein said engagement means does not extend into said channel; and
- locking means moveable between a locking position wherein said locking means retains said engagement means in said first position, and in unlocking position wherein said locking means permits said engagement means to move to said second position.
2. An assembly for releasably mounting a rudder on a boat, said assembly comprising, in combination, an elongated cylindrical pintle having one end affixed to means extending substantially normally to and adjacent one end of said pintle for mounting said pintle on said boat in an erect position, said pintle having an annular circumferential recess disposed intermediate its ends;
- a gudgeon having an elongated cylindrical channel therein and including means extending outwardly from said gudgeon substantially normally of the axis of said channel for coupling said gudgeon to said rudder;
- said channel having at least one opening in the wall thereof intermediate its ends;
- said gudgeon including engagement means moveable between a first position wherein said engagement means so projects through said opening into said channel and said recess when said pintle is disposed in a predetermined position in said channel as to positively prevent movement of said pintle along said channel due to engagement of said engagement means with the wall of said recess, and a second position wherein said engagement means is not engageable with the wall of said recess; and
- locking means moveable between a locking position wherein said locking means retains said engagement means in said first position, and in unlocking position wherein said locking means permits said engagement means to move to said second position.
3. An assembly for releasably mounting a rudder on a boat, said assembly comprising, in combination, an elongated cylindrical pintle having one end affixed to means extending substantially normally to and adjacent one end of said pintle for mounting said pintle on said boat in an erect position, said pintle having an annular circumferential recess disposed intermediate its ends;
- a gudgeon having elongated cylindrical portion including a cylindrical channel coaxially disposed therein; said gudgeon also including means extending outwardly from said gudgeon substantially normally of the axis of said channel for coupling said cylindrical portion to said rudder;
- said portion having intermediate its ends at least one

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opening from the exterior thereof into said channel; said gudgeon including engagement means moveable between a first position wherein said engagement means so projects through said opening into said channel and said recess when said pintle is disposed in a predetermined position in said channel as to positively prevent movement of said pintle along said channel due to engagement of said engagement means with the wall of said recess, and a second position wherein said engagement means is not engageable with the wall of said recess;

said gudgeon having a cylindrical interior coaxially disposed about said cylindrical portion for reversible movement between a locking position wherein said element holds said engagement means in said first position, and an unlocking position wherein said engagement means is free to move in said opening so as to not project into said channel.

4. An assembly as defined in claim 3 wherein the said opening has a predetermined diameter at said channel and said engagement means is a sphere having a diameter small enough to prevent a portion of said sphere to project into said channel but larger than said determined diameter.

5. An assembly as defined in claim 4 wherein the depth of said opening through said cylindrical portion is dimensioned such that when said sphere in said opening is substantially tangent to a plane across said opening at the exterior of said portion, said sphere extends into said channel in first position.

6. An assembly as defined in claim 3 wherein said element has coaxial annular groove in said cylindrical interior disposed intermediate the ends of said element, the portion of said interior at least adjacent said groove being dimensioned to provide a sliding fit about said pintle at least adjacent said opening, said groove being dimensioned such that when said element is positioned with said groove across said opening, said element is in said unlocking position and said engagement means is free to move in said opening into said groove and out of said channel.

7. An assembly as defined in claim 6 wherein said element is moveable axially along said elongated portion at least between said locking and said unlocking positions, and wherein said assembly includes a pair of limit stops on said elongated portion for limiting the axial moveability of said element.

8. An assembly as defined in claim 7 wherein said opening has a predetermined diameter at said channel and said engagement means is a sphere having a diameter small enough to prevent a portion of said sphere to project into said channel but larger than said determined diameter, and the depth of said opening through said cylindrical portion is dimensioned such that when said portion of said interior of said element adjacent said groove is across said opening, said sphere element is in said locking position.

9. An assembly for releasably mounting a rudder on a boat, said assembly comprising, in combination,

an elongated cylindrical pintle having one end affixed to means extending substantially normally to and adjacent one end of said pintle for mounting said pintle on said boat in an erect position, said pintle having an annular circumferential recess disposed intermediate its ends;

a gudgeon having an elongated cylinder and including means extending outwardly from said cylinder substantially normal to the cylindrical axis of said cylinder, said cylinder including a coaxial cylindrical channel dimensioned to a slidingly fit about said pintle and having a said cylinder including a plurality of openings extending in tapered form from the exterior to the interior of said cylinder, the long axes of said opening all lying substantially in a common cross-section plane across said cylinder disposed intermediate its ends;

each of said openings having disposed therein a sphere having a diameter greater than the diameter of the end of the corresponding opening into said channel;

a second cylinder having coaxial annular groove internally thereof intermediate its ends, elongated cylinder and being shorter than and slidable axially along the latter in close fitting relation thereto between at least locking position wherein the interior wall of said second cylinder being mounted about said elongated cylinder adjacent said recess covers said openings so as to retain said spheres in a position wherein they extend sufficiently into said channel and into said recess when said pintle is disposed in a predetermined relation wherein said recess is across said openings as positively prevent axial movement of said pintle and gudgeon relative to one another, and an unlocking position wherein said groove is across said openings so that said spheres can move into said groove and out of said channel and recess for permitting relative axial movement of said pintle and gudgeon.

10. An assembly as defined in claim 9 wherein said second cylinder is normally maintained in its locking position and wherein a force must be applied to said second cylinder to move it axially into said unlocking position.

11. An assembly as defined in claim 10 wherein the weight of said second cylinder is sufficient normally to hold it against a limit stop in said locking position.

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