CLAIMS

1. A threaded connection between first and second tubulars comprising:

interface surfaces on the first and second surfaces that abut when the threaded connection is made up;

a recess in a side of the first tubular adjacent the interface surface of the first tubular;

a key mounted in the recess, the key being rotatable an increment about a key axis that is generally perpendicular to a first tubular axis of the first tubular, the key comprising:

a non-circular perimeter; and

a locking surface on a portion of the perimeter farther from the key axis than a distance from the key axis to the interface surface of the second tubular when the threaded connection is made up, the locking surface having at least one tooth that is in gripping contact with the interface surface of the second tubular when the key is rotated in a first direction about the key axis to locked position to resist decoupling rotation of the first and second tubulars.

2. The threaded connection of claim 1, wherein the recess has a lateral surface that is engaged by a portion of the perimeter of the key while the key is in the locked position.

3. The threaded connection of claim 1, further comprising a fastener that inserts along the key axis through a bore in the key and into a receptacle in a base of the recess, the key being rotatable around the fastener.

4. The threaded connection of claim 1, further comprising a loading element selectively inserted into the recess adjacent the key for setting the key into an engaging orientation with the tooth in contact with the interface surface of the second tubular.

5. The threaded connection of claim 4, wherein a portion of the perimeter of the key is in interfering contact with the loading element while the key is in the locked position.

6. The threaded connection of claim 1, wherein the at least one tooth comprises a row of teeth, with a first tooth in the row being closer to the key axis than a last tooth in the row.

7. The threaded connection of claim 1, wherein the tooth bites into the interface surface of the second tubular while the key is in the locked position.

8. The threaded connection of claim 1, wherein:

the recess has a partially circular lateral edge portion that is on a lagging side of the key axis relative to the direction of uncoupling rotation of the first tubular; and

the perimeter of the key has a partially circular portion that is in contact with the circular lateral edge portion of the recess when the key is in the locked position.

9. The threaded connection of claim 1, wherein:

the recess has a flat edge portion that faces generally toward the interface surface of the second tubular;

the perimeter of the key has a flat portion that abuts the flat edge portion of the recess while the key is in an unlocked position; and

the abutment of the flat portion of the key with the flat edge portion of the recess provides a stop for rotation of the key about the key axis in a second direction.

10. The threaded connection of claim 1, wherein the locking surface is positioned such that any decoupling rotation of the first and second tubulars causes the key to rotate farther about the key axis in the first direction and the tooth to imbed into the interface surface of the second tubular to resist the decoupling rotation.

11. The threaded connection of claim 1, wherein the at least one tooth comprises a row of teeth that is flat and parallel with the interface surface of the second tubular while the key is in the locked position.

12. A method of retaining a threaded connection between a first tubular and a second tubular, the first and second tubulars having mating interface surfaces that abut each other while the threaded connection is made up, the method comprising:

a. providing a key having a perimeter with a variable radius relative to a key axis of the key, the perimeter having a locking surface with at least one tooth;

b. pinning the key in a recess formed along a portion of a circumference of the first tubular and joining the interface surface of the first tubular, the pinning locating the locking surface farther from the key axis than a distance from the key axis to the interface surface of the second tubular when the threaded connection is made up, and so that the key is rotatable about the key axis; and

c. rotating the key in a first direction to a set position so that the tooth of the key is in contact with the interface surface of the second tubular, and so that when one of the first or second tubulars rotate in a decoupling direction, the key rotates further in the first direction about the key axis to a locked position causing the contact between the tooth of the key and interface surface of the second tubular to generate a force that resists further decoupling of the first and second tubular.

13. The method of claim 12, wherein the at least one tooth embeds into the interface surface while rotating the key further in the first direction.

14. The method of claim 12, wherein rotating the key further in the first direction causes a portion of the perimeter of the key to engage a lateral surface of the recess.

15. The method of claim 12, further comprising inserting a loading element in the recess adjacent the key in interfering contact with the perimeter of the key, and the step of rotating the key to a set position occurs by rotating the loading element about a loading element axis in a second direction.

16. The method of claim 12, wherein said at least one tooth comprises a row of teeth, with a first tooth in the row being closer to the key axis than a last tooth in the row.

17. The method of claim 12, wherein:

the recess has a flat edge portion that faces generally toward the interface surface of the second tubular;

the perimeter of the key has a flat portion; and the method further comprises:

prior to rotating the key in the first direction, rotating the key in a second direction until the flat portion of the perimeter of the key abuts the flat edge portion of the recess.

18. A threaded connection between first and second tubulars comprising:

the first and second tubulars having mating threads that engage each other and interface surfaces that abut each other when the connection is made up, the interface surfaces being in a plane perpendicular to a threaded connection axis of the threaded connection;

a recess in an outer surface at the interface surface of the first tubular;

a key having a bore with a key axis, the key having a perimeter with a varying radius from the key axis, the perimeter of the key having a locking surface with at least one tooth that is farther from the key axis than a distance from the interface surface of the second tubular to the key axis when the first and second tubulars are made up;

a fastener extending in a direction that is generally radial with the threaded connection axis, through the bore into a receptacle in a base of the recess, the key being rotatable around the fastener from an unlocked position to a set position;

the unlocked position allowing rotation of the tubulars relative to each other in a coupling direction; and

the locking surface of the key being urged into gripping contact with the interface surface of the second tubular when the key is in a set position, and so that when at least a one of the first and second tubulars rotates in a decoupling direction, the gripping contact between the locking surface and the interface surface of the second tubular further rotates the key from the set position into a locked configuration that generates a force to oppose decoupling of the first and second tubulars.

19. The anti-rotation system of claim 18, wherein said at least one tooth comprises a plurality of teeth.

20. The anti-rotation system of claim 18, wherein said at least one tooth comprises a row of teeth, with a first tooth in the row being closer to the bore axis than a last tooth in the row.