WHAT IS CLAIMED IS:

1. A safety joint for use in a subterranean well, the safety joint comprising:

first and second separable portions which, when separated, disconnect sections of a tubular string, and

wherein elongation of the safety joint is permitted while longitudinal compression of the safety joint is prevented.

2. The safety joint of claim 1, further comprising a locking device which prevents the longitudinal compression of the safety joint.

3. The safety joint of claim 2, wherein the locking device comprises a resilient toothed member.

4. The safety joint of claim 3, wherein the resilient toothed member comprises a longitudinally split ring.

5. The safety joint of claim 2, wherein the locking device grips an external surface of a generally tubular mandrel.

6. The safety joint of claim 5, wherein the external surface is gripped by an internally toothed member.

7. The safety joint of claim 1, wherein the locking device prevents longitudinal compression of the safety joint in response to a predetermined amount of the elongation of the safety joint.

8. A method of activating a safety joint in a subterranean well, the method comprising:

providing the safety joint with first and second portions having end connectors which interconnect the safety joint between sections of a tubular string;

permitting elongation of the safety joint, thereby facilitating parting of the tubular string sections; and

then preventing longitudinal compression of the safety joint prior to the tubular string parting.

9. The method of claim 8, wherein the permitting is performed after interconnecting the safety joint between the sections of the tubular string and installing the tubular string in the well.

10. The method of claim 8, wherein the preventing is performed after a predetermined amount of the elongation of the safety joint is achieved.

11. The method of claim 8, wherein the preventing further comprises a locking device engaging, thereby preventing the end connectors from displacing toward each other.

12. The method of claim 11, wherein the locking device comprises a resilient toothed member.

13. The method of claim 11, wherein the locking device engages an external surface of a generally tubular mandrel of the safety joint.

14. The method of claim 13, wherein the external surface comprises a toothed surface which is engaged by the locking device.

15. The method of claim 11, wherein the preventing comprises preventing a packer mandrel from displacing relative to a packer drag block.

16. The method of claim 11, wherein the preventing comprises preventing a packer from setting.

17. A safety joint for use in a subterranean well, the safety joint comprising:

first and second separable portions; and

a locking device which permits relative displacement between a generally tubular mandrel and a component of the safety joint in a first direction, and prevents relative displacement between the mandrel and the component in a second direction opposite to the first direction.

18. The safety joint of claim 17, wherein the locking device comprises a resilient toothed member.

19. The safety joint of claim 17, wherein the locking device grips an external surface of a generally tubular mandrel.

20. The safety joint of claim 17, wherein the locking device prevents relative displacement between the mandrel and the component in the second direction in response to a predetermined amount of relative displacement between the mandrel and the component in the first direction.

What is claimed is:

1. A safety joint for use in a subterranean well, the safety joint comprising:

first and second separable portions which, when separated, disconnect sections of a tubular string, and

wherein longitudinal compression of the safety joint is prevented immediately following elongation of the safety joint.

2. The safety joint of claim **1**, further comprising a locking device which prevents the longitudinal compression of the safety joint.

3. The safety joint of claim **2**, wherein the locking device comprises a resilient toothed member.

4. The safety joint of claim **3**, wherein the resilient toothed member comprises a longitudinally split ring.

5. The safety joint of claim **2**, wherein the locking device grips an external surface of a generally tubular mandrel.

6. The safety joint of claim **5**, wherein the external surface is gripped by an internally toothed member.

7. The safety joint of claim **2**, wherein the locking device prevents longitudinal compression of the safety joint in response to a predetermined amount of the elongation of the safety joint.

8. A method of activating a safety joint in a subterranean well, the method comprising:

providing the safety joint with first and second portions having end connectors which interconnect the safety joint between sections of a tubular string;

elongating the safety joint while simultaneously preventing subsequent longitudinal compression of the safety joint, thereby facilitating parting of the tubular string sections; and

then parting the tubular string sections.

9. The method of claim **8**, wherein the permitting is performed after interconnecting the safety joint between the sections of the tubular string and installing the tubular string in the well.

10. The method of claim **8**, wherein the preventing is performed after a predetermined amount of the elongation of the safety joint is achieved.

11. The method of claim **8**, wherein the preventing further comprises a locking device engaging, thereby preventing the end connectors from displacing toward each other.

12. The method of claim **11**, wherein the locking device comprises a resilient toothed member.

13. The method of claim **11**, wherein the locking device engages an external surface of a generally tubular mandrel of the safety joint.

14. The method of claim **13**, wherein the external surface comprises a toothed surface which is engaged by the locking device.

15. The method of claim **11**, wherein the preventing comprises preventing a packer mandrel from displacing relative to a packer drag block.

16. The method of claim **11**, wherein the preventing comprises preventing a packer from setting.

17. A safety joint for use in a subterranean well, the safety joint comprising:

first and second separable portions; and

a locking device which permits relative displacement between a generally tubular mandrel and a component of the safety joint in a first direction, and prevents subsequent relative displacement between the mandrel and the component in a second direction opposite to the first direction.

18. The safety joint of claim **17**, wherein the locking device comprises a resilient toothed member.

19. The safety joint of claim **17**, wherein the locking device grips an external surface of a generally tubular mandrel.

20. The safety joint of claim **17**, wherein the locking device prevents relative displacement between the mandrel and the component in the second direction in response to a predetermined amount of relative displacement between the mandrel and the component in the first direction.