WHAT IS CLAIMED IS:

1. A well tool, comprising:

a housing;

an actuator sleeve in the housing; and

an actuator in the housing comprising a spring and an internal shifting tool engaging profile,

the actuator responsive, independent of well annulus pressure, to a remote hydraulic signal in a central bore of the well tool to change from an unactuated state, with the spring compressed, to an actuated state, with the spring expanded to shift the actuator sleeve from a first position to a second position, and

the actuator responsive to reset to the unactuated state when the spring is re-compressed using the internal shifting tool engaging profile.

2. The well tool of claim 1, further comprising a valve closure and where the actuator sleeve is coupled to the valve closure and operates the valve closure between an open and closed state when the actuator sleeve is moved between the first position and the second position.

3. The well tool of claim 1, where the actuator comprises:

a piston in the housing, the piston responsive, independent of well annulus pressure, to pressure cycles in the central bore to reciprocate in the housing;

a spring mandrel in the housing coupled to move with an end of the spring as the spring expands, the spring mandrel comprising a latch finger;

a sleeve in the housing comprising threads, the sleeve arranged to grip the collet finger and support the spring mandrel with the spring compressed when the sleeve is in a first position and to release the collet finger when the sleeve is in a second position; and

a cam ring coupled to the piston to rotate in the housing by movement of the

piston, the cam ring comprising threads that mate with the threads of the sleeve and when mated maintain the sleeve in the first position.

4. The well tool of claim 3, where the threads of the sleeve comprise an axial split to allow the threads to flex radially and ratchet over the threads of the cam ring without being screwed together when the sleeve and cam ring are driven together.

5. The well tool of claim 3, where the cam ring comprises a repeating pattern of generally J-shaped slots and the piston comprises a pin received in the slots.

6. The well tool of claim 3, where the piston is springingly biased to a first position and moves to a second position upon a change of pressure in the central bore.

7. The well tool of claim 1, where the actuator sleeve comprises a second internal shifting tool engaging profile.

8. The well tool of claim 7, where the actuator sleeve is moveable between the first and second position, apart from operation of the actuator, via the second internal shifting tool engaging profile when the actuator is in the unactauted state.

9. The well tool of claim 7, where the actuator sleeve is moveable between the first and second positions, apart from operation of the actuator, via the second internal shifting tool engaging profile when the actuator is in the actuated state.

10. A method of actuating a well tool in a well, comprising:

changing to an actuated state in response to a remote hydraulic signal in a central bore of the well tool, independent of well annulus pressure, the changing comprising releasing a spring to shift an actuator sleeve of the well tool; and

resetting from the actuated state to an unactauted state when the spring is compressed using a shifting tool manipulated from outside of the well.

11. The method of claim 10, where shifting the actuator sleeve moves a valve closure of the well tool between an open and closed state.

12. The method of claim 10, comprising, prior to changing to the actuated state, shifting the actuator sleeve apart from operation of the actuator.

13. The method of claim 10, comprising, prior to changing to the actuated state, shifting the actuator sleeve multiple times between an uphole position and a downhole position apart from operation of the actuator.

14. The method of claim 10, comprising, after changing to the actuated state, shifting the actuator sleeve apart from operation of the actuator.

15. The method of claim 10, where changing to an actuated state comprises unthreading a threaded connection of the actuator; and

where resetting from the actuated state to an unactauted state comprises coupling the threaded connection by ratcheting a first thread portion over a second thread portion.

16. The method of claim 10, where changing to an actuated state in response to a remote hydraulic signal in a central bore of the well tool comprises changing to the actuated state in response to a specified number of pressure cycles in the central bore of the well tool.

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

an actuator sleeve coupled to an actuated element of the device to operate the actuated element when the actuator shifts axially in the device; and

an actuator comprising a spring to act on the actuator sleeve,

the actuator responsive, independent of well annulus pressure, to a remotely generated hydraulic signal in a central bore of the device to change from an unactuated state, with the spring compressed, to an actuated state, with the spring expanded to shift the actuator sleeve from a first position to a second position, and

the actuator responsive to reset to the unactuated state when the spring is re-compressed.

18. The device of claim 17, where:

in the actuated state a spring mandrel is supported to support the spring compressed by a threaded connection;

in the unactauted state, the threaded connection is unthreaded; and

where the threaded connection comprises two parts configured to ratchet together.

19. The device of claim 17, where the actuated element comprise a valve closure.

20. The device of claim 17, where the actuator sleeve is moveable between the first and second position, apart from operation of the actuator.

CLAIMS

What is claimed is:

1. A well tool, comprising:

a housing;

an actuator sleeve in the housing; and

an actuator in the housing comprising a spring and an internal shifting tool engaging profile, the actuator responsive, independent of well annulus pressure, to a remote hydraulic signal in a central bore of the well tool to change from an unactuated state, with the spring compressed, to an actuated state, with the spring expanded to shift the actuator sleeve from a first position to a second position, the actuator responsive to reset to the unactuated state when the spring is recompressed using the internal shifting tool engaging profile, and a piston in the housing, the piston responsive, independent of well annulus pressure, to pressure cycles in the central bore to reciprocate in the housing, a spring mandrel in the housing coupled to move with an end of the spring as the spring expands, the spring mandrel comprising a latch finger, a sleeve in the housing comprising threads, the sleeve arranged to grip the latch finger and support the spring mandrel with the spring compressed when the sleeve is in a first position and to release the latch finger when the sleeve is in a second position, and a cam ring coupled to the piston to rotate in the housing by movement of the piston, the cam ring comprising threads that mate with the threads of the sleeve and when mated maintain the sleeve in the first position.

2. The well tool of claim 1, further comprising a valve closure and where the actuator sleeve is coupled to the valve closure and operates the valve closure between an open and closed state when the actuator sleeve is moved between the first position and the second position.

3. The well tool of claim 1, where the threads of the sleeve comprise an axial split to allow the threads to flex radially and ratchet over the threads of the cam ring without being screwed together when the sleeve and cam ring are driven together.

4. The well tool of claim 1, where the cam ring comprises a repeating pattern of generally J-shaped slots and the piston comprises a pin received in the slots.

5. The well tool of claim 1, where the piston is springingly biased to a first position and moves to a second position upon a change of pressure in the central bore.

6. The well tool of claim 1, where the actuator sleeve comprises a second internal shifting tool engaging profile.

7. The well tool of claim 6, where the actuator sleeve is moveable between the first and second position, apart from operation of the actuator, via the second internal shifting tool engaging profile when the actuator is in the unactuated state.

8. The well tool of claim 6, where the actuator sleeve is moveable between the first and second positions, apart from operation of the actuator, via the second internal shifting tool engaging profile when the actuator is in the actuated state.

9. The well tool of claim 1, where, after being reset to the unactuated state, the actuator is responsive to a second remote hydraulic signal in the central bore of the well tool to change from the unactuated state to the actuated state.

10. The well tool of claim 9, where, after changing to the actuated state in response to the second remote hydraulic signal, the actuator is again responsive to reset to the unactuated state when the spring is recompressed using the internal shifting tool engaging profile.

11. A method of actuating a well tool in a well, comprising:

changing to an actuated state in response to a remote hydraulic signal in a central bore of the well tool, independent of well annulus pressure, the changing comprising releasing a spring to shift an actuator sleeve of the well tool;

resetting from the actuated state to an unactauted state when the spring is compressed using a shifting tool manipulated from outside of the well; and

where resetting from the actuated state to an unactauted state comprises coupling a threaded connection by ratcheting a first thread portion over a second thread portion.

12. The method of claim 11, where shifting the actuator sleeve moves a valve closure of the well tool between an open and closed state.

13. The method of claim 11, comprising, prior to changing to the actuated state, shifting the actuator sleeve apart from operation of the actuator.

14. The method of claim 11, comprising, prior to changing to the actuated state, shifting the actuator sleeve multiple times between an uphole position and a downhole position apart from operation of the actuator.

15. The method of claim 11, comprising, after changing to the actuated state, shifting the actuator sleeve apart from operation of the actuator.

16. The method of claim 11, where changing to an actuated state in response to a remote hydraulic signal in a central bore of the well tool comprises changing to the actuated state in response to a specified number of pressure cycles in the central bore of the well tool.

17. The method of claim 11, comprising, again, changing to the actuated state in response to a second remote hydraulic signal in the central bore of the well tool.

18. The method of claim 17, comprising, again, resetting from the actuated state to the unactuated state when the spring is compressed using a shifting tool manipulated from outside of the well.

19. The method of claim 11, comprising changing to the actuated state and resetting to the unactuated state multiple times.

20. A device for use in a subterranean well, the device comprising:

an actuator sleeve coupled to an actuated element of the device to operate the actuated element when the actuator shifts axially in the device; and

an actuator comprising a spring to act on the actuator sleeve, the actuator responsive, independent of well annulus pressure, to a remotely generated hydraulic signal in a central bore of the device to change from an unactuated state, with the spring compressed, to an actuated state, with the spring expanded to shift the actuator sleeve from a first position to a second position, the actuator responsive to reset to the unactuated state when the spring is recompressed, and in the actuated state a spring mandrel is supported to support the spring compressed by a threaded connection, and in the unactuated state, the threaded connection is unthreaded; and

where the threaded connection comprises two parts configured to ratchet together.

21. The device of claim 20, where the actuated element comprises a valve closure.

22. The device of claim 20, where the actuator sleeve is moveable between the first and second position, apart from operation of the actuator.