CLAIMS

1. A system, comprising:

a split gate valve, comprising:

first and second gate sections coupled together and configured to move together within a cavity of the split gate valve between an open position and a closed position;

a rolling actuator configured to reduce friction and to convert a rotational input into a linear motion to move the first and second gate sections between the open and closed positions; and

at least one expansion bar configured to bias the first and second gate sections away from one another to seal against opposite seats of the split gate valve, wherein each expansion bar of the at least one expansion bar comprises a spring ~~mechanism~~ section configured to compress upon moving the first and second gate sections into and beyond the closed position to prevent buckling of the respective expansion bar.

2. The system of claim 1, wherein the first and second gate sections form a slot configured to engage each expansion bar of the at least one expansion bar as the first and second gate sections move from the open position to the closed position.

3. The system of claim 2, wherein the slot comprises a first portion that tapers at a first angle relative to a longitudinal axis of the split gate valve, and each expansion bar of the at least one expansion bar comprises a tapered end configured to bias the first and second gate sections away from one another as the tapered end engages the first portion of the slot.

4. The system of claim 3, wherein the slot comprises a second portion offset from the first portion along the longitudinal axis, the second portion tapers at a second angle relative to the longitudinal axis, and the tapered end of each

expansion bar of the at least one expansion bar is configured to bias the first and second gate sections away from one another as the tapered end engages the second portion of the slot.

5. The system of claim 4, wherein the first angle equals the second angle.

6. The system of claim 4, wherein the first angle is different from the ~~first~~ second angle.

7. The system of claim 1, wherein the split gate valve comprises a body, and each expansion bar of the at least one expansion bar comprises a protruding end configured to engage the body to maintain the respective expansion bar in a stationary position as the first and second gate sections move between the open and closed positions.

8. The system of claim 1, wherein each expansion bar of the at least one expansion bar comprises a first end and a second end, the spring ~~mechanism~~ section comprises a first spring ~~mechanism~~ section having a groove disposed along a portion of a length of the respective expansion bar between ~~and offset from~~ the first and second ends, and the groove is configured to compress upon moving the first and second gate sections into and beyond the closed position to prevent buckling of the respective expansion bar.

9. The system of ~~claim 1~~claim 8, wherein the spring ~~mechanism~~ section comprises ~~a first spring mechanism and~~ a second spring ~~mechanism that are separate from one another along~~ section disposed between the first end and the groove of each expansion bar of the at least one expansion bar, and the second spring ~~mechanism~~ section is configured to compress upon moving the first and second gate sections into and beyond the closed position to prevent buckling of the respective expansion bar.

10. The system of claim 9, wherein the ~~first spring mechanism comprises a slot extending along an axis of the expansion bar, and the~~ second spring ~~mechanism~~ section comprises a plurality of ~~one or more slots extending crosswise to the axis of the expansion bar~~.

11. The system of ~~claim 1~~claim 9, wherein the second spring ~~mechanism~~ section comprises a plurality of notches, a plurality of orifices, or a combination thereof. ~~one or more slots extending crosswise to an axis of the expansion bar.~~

12. The system of claim 1, wherein the at least one expansion bar comprises a first expansion bar and a second expansion bar, the first and second expansion bars each having at least one spring section configured to compress upon moving the first and second gate sections into and beyond the closed position to prevent buckling of the first and second expansion bars. ~~rolling actuator comprises a screw shaft, a nut, and a plurality of rollers between the screw shaft and the nut.~~

13. The system of claim 1, wherein the at least one expansion bar itself is compressible via the spring section.

14~~13~~. A system, comprising:

a split gate valve, comprising:

first and second gate sections coupled together and configured to move together within a cavity of the split gate valve between an open position and a closed position; and

at least one expansion bar configured to bias the first and second gate sections away from one another to seal against opposite seats of the split gate valve, wherein each expansion bar of the at least one expansion bar comprises a spring ~~mechanism~~ section that is compressible, and the spring ~~mechanism~~ section is disposed between and offset from opposite first and second ends of the respective expansion bar.

1514. The system of ~~claim 13~~claim 14, wherein the first and second gate sections form a slot configured to support each expansion bar of the at least one expansion bar as the first and second gate sections move from the open position to the closed position, and the respective expansion bar is configured to wedgingly engage the slot upon moving the first and second gate sections into the closed position.

1615. The system of ~~claim 13~~claim 14, wherein the spring ~~mechanism~~ section is configured to compress upon moving the first and second gate sections into and beyond the closed position to prevent buckling of each expansion bar of the at least one expansion bar.

1716. The system of ~~claim 15~~ claim 16, wherein each expansion bar of the at least one expansion bar comprises a groove extending lengthwise along a portion of a length of the respective expansion bar between and offset from the opposite first and second ends of the respective expansion bar, and the groove is configured to compress upon moving the first and second gate sections into and beyond the closed position to prevent buckling of the respective expansion bar.

1817. The system of ~~claim 15~~ claim 16, wherein the spring ~~mechanism~~ section comprises a plurality of slots extending crosswise to a longitudinal axis of each expansion bar of the at least one expansion bar, and the plurality of slots are configured to compress upon moving the first and second gate sections into and beyond the closed position to prevent buckling of the respective expansion bar.

1918. The system of ~~claim 13~~claim 14, wherein the ~~split gate valve~~ at least one expansion bar comprises a first expansion bar and a second expansion bar, the first and second expansion bars each having at least one spring ~~mechanism~~ section configured to compress upon moving the first and second gate sections

into and beyond the closed position to prevent buckling of the first and second expansion bars.

20. The system of claim 14, wherein the at least one expansion bar itself is compressible via the spring section.

2119. A system, comprising:

a split gate valve; and

at least one expansion bar configured to bias first and second gate sections of ~~a~~ the split gate valve away from one another to seal against opposite seats of the split gate valve as the first and second gates move together within a cavity of the split gate valve between an open position and a closed position, wherein each expansion bar of the at least one expansion bar comprises a spring ~~mechanism~~ section configured to compress upon moving the first and second gate sections into and beyond the closed position to prevent buckling of the respective expansion bar.

2220. The system of ~~claim 19~~claim 21, comprising the split gate valve having the first and second gate sections coupled together and configured to move together within the cavity of the split gate valve between the open position and the closed position, the first and second gate sections form a slot configured to support each expansion bar of the at least one expansion bar as the first and second gate sections move from the open position to the closed position, and respective expansion bar is configured to wedgingly engage the slot upon moving the first and second gate sections into the closed position.

2321. The system of ~~claim 19~~claim 21, wherein the spring ~~mechanism~~ section comprises one or more slots extending crosswise to a longitudinal axis of the respective expansion bar.

24. The system of claim 21, wherein the spring section enables compression of the at least one expansion bar in a longitudinal direction or a crosswise direction relative to an axis of the at least one expansion bar.

25. The system of claim 21, wherein the at least one expansion bar itself is compressible via the spring section.