CLAIMS

1. A system, comprising:

a split gate valve, comprising:

a body having a bore and a cavity;

first and second gate sections coupled together and configured to move together within ~~a~~ the cavity of the split gate valve along a path of travel between an open position and a closed position relative to the bore, wherein the first and second gate sections comprise respective first and second openings that selectively align with the bore in the open position;

a biasing mechanism disposed between the first and second gate sections, wherein the biasing mechanism biases the first and second gate sections away from one another to form opposite seals with opposite seats of the split gate valve along an entirety of the path of travel; and

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 along the path of travel between the open and closed positions, wherein the rolling actuator comprises a plurality of rollers or a plurality of balls disposed along a spiraling path.

2. The system of claim 1, wherein the ~~split gate valve comprises a~~ bore ~~having~~ has a diameter of at least ~~approximately~~ 4 inches, or the split gate valve has a pressure rating of at least ~~approximately~~ 10,000 psi, or a combination thereof.

3. The system of claim 1, wherein the ~~split gate valve comprises a~~ bore ~~having~~ has a diameter of at least 9 inches, or the split gate valve has a pressure rating of at least ~~approximately~~ 5,000 psi, or a combination thereof.

4. The system of claim 1, wherein the ~~split gate valve comprises a body having the cavity,~~ body has a rectangular perimeter along an entire length from a first rectangular side to a second rectangular side of the body, the body has an

opening into the cavity on the first rectangular side, and the opening supports the first and second gate sections.

5. The system of ~~claim 1~~claim 4, wherein the cavity has a substantially rectangular perimeter with four flat interior sides that extend along an axis of axial movement of the first and second gate sections along the path of travel through the body from the first rectangular side toward the second rectangular side, and the first and second gate sections collectively define four flat exterior sides disposed along the four flat interior sides of the cavity. ~~comprising a biasing mechanism disposed between the first and second gate sections, wherein the biasing mechanism is configured to bias the first and second gate sections away from one another to form opposite seals with opposite seats of the split gate valve.~~

6. The system of ~~claim 5~~claim 1, wherein the biasing mechanism comprises at least one spring oriented crosswise to the path of travel of the first and second gate sections.

7. The system of claim 1, wherein the rolling actuator is located outside the cavity of the split gate valve.

8. The system of claim 1, wherein the rolling actuator is located inside the cavity of the split gate valve.

9. The system of claim 1, wherein the rolling actuator comprises a ball screw and the plurality of balls.

10. The system of claim 1, wherein the rolling actuator comprises a roller screw and the plurality of rollers.

11. The system of claim 1, wherein the split gate valve is configured to supply a fluid into the cavity to test both of the opposite seals at a same time.

12. The system of claim 1, wherein the split gate valve is configured to supply a fluid into the cavity to isolate the fluid within the cavity.

13. The system of claim 1, wherein the split gate valve is configured to supply a fluid into the cavity to bias the first and second gate sections away from one another to form the opposite seals with the opposite seats of the split gate valve.

14. The system of claim 1, wherein the biasing mechanism comprises an elastic material.

15. The system of claim 1, wherein the biasing mechanism comprises a cam mechanism.

16. The system of claim 1, comprising a coupling mechanism disposed between the first and second gate sections, wherein the coupling mechanism guides movement of the first and second gate sections toward and away from one another in a crosswise direction relative to the path of travel.

17. The system of claim 16, wherein the coupling mechanism comprises a pin extending into slots within the first and second gate sections.

18. The system of claim 17, wherein the coupling mechanism and the biasing mechanism are disposed adjacent one another.

19. The system of claim 1, wherein the first gate section is made of a first material, the second gate section is made of a second material, and the first and second materials are different from one another.

20. The system of claim 1, comprising a gearbox coupled to a drive, wherein the gear box is coupled to the split gate valve between the drive and the rolling actuator.

21. The system of claim 1, comprising a first stem coupled to a first end portion of the first and second gate sections and a second stem coupled to a second end portion of the first and second gate sections, wherein axes of the first and second stems are aligned with an axis of axial movement of the first and second gate sections along the path of travel through the split gate valve.

22. The system of claim 21, wherein the first or second end portion comprises a T-connector.

23. The system of claim 1, wherein the biasing mechanism is recessed into the first and second gate sections.

24. The system of claim 1, wherein the biasing mechanism comprises a plurality of biasing elements disposed at different locations between the first and second gate sections.

25. The system of claim 1, wherein:

the split gate valve comprises opposite first and second stem portions extending axially away from opposite ends of the first and second gate sections relative to an axis of axial movement of the first and second gate sections along the path of travel; and

the biasing mechanism comprises a spring, an elastic material, or a combination thereof, that provides an outward biasing force in opposite directions crosswise to the axis of axial movement of the first and second gate sections along the path of travel.

26. The system of claim 1, wherein:

the split gate valve comprises opposite first and second stem portions extending axially away from opposite ends of the first and second gate sections relative to an axis of axial movement of the first and second gate sections along the path of travel; and

the body has an opening into the cavity on a first side, wherein the body has a rectangular perimeter directly from the first side toward a second side of the body.

2711. A system, comprising:

a split gate valve, comprising:

a body ~~comprising an opening into~~ having a bore and a cavity~~, wherein the opening is configured to reduce deflection of the body during operation of the split gate valve~~; ~~and~~

first and second gate sections coupled together ~~to form a gate assembly~~ and configured to move together within ~~along the opening into~~ the cavity of the split gate valve along a path of travel between an open position and a closed position relative to the bore, wherein the first and second gate sections comprise respective first and second openings that selectively align with the bore in the open position;

first and second stem portions extending axially away from opposite ends of the first and second gate sections relative to an axis of the path of travel of the first and second gate sections;

at least one biasing element disposed between the first and second gate sections, wherein the at least one biasing element biases the first and second gate sections away from one another in opposite directions that are crosswise to the axis along an entirety of the path of travel; and

a rolling actuator configured to move the first and second gate sections along the path of travel between the open and closed positions, wherein the rolling actuator comprises a plurality of rollers or a plurality of balls disposed along a spiraling path.

~~12. The system of claim 11, wherein the body comprises a bore having a diameter of at least approximately 4 inches, the split gate valve has a pressure rating of at least approximately 10,000 psi, or a combination thereof.~~

~~13. The system of claim 11, comprising a biasing mechanism disposed between the first and second gate sections, wherein the biasing mechanism is configured to bias the first and second gate sections away from one another to form opposite seals with opposite seats of the split gate valve.~~

28~~14~~. The system of ~~claim 13~~claim 27, wherein the at least one biasing ~~mechanism~~ element comprises ~~at least one~~ a plurality of springs disposed at different locations between the first and second gate sections.

29. The system of claim 27, wherein the cavity extends in an axial direction from an opening in a first side of the body toward a second side of the body, and the cavity and an outer perimeter of the body are substantially rectangular directly from the first side toward the second side.

~~15. The system of claim 11, wherein the split gate valve comprises a rolling actuator configured to reduce friction and to convert rotational input into a linear motion to move the first and second gate sections between the open and closed positions.~~

~~16. The system of claim 15, wherein the rolling actuator comprises a ball screw or a roller screw.~~

30~~17~~. A method, comprising:

converting a rotational input into a linear motion to actuate a split gate valve via a rolling actuator to move first and second gate sections of the split gate valve along a path of travel between open and closed positions, wherein the

rolling actuator comprises a plurality of rollers or a plurality of balls disposed along a spiraling path; and

seating first and second gate sections of the split gate valve against opposite first and second seats to provide a double seal, wherein at least one biasing element biases the first and second gate sections away from one another to form opposite seals with opposite seats of the split gate valve along an entirety of the path of travel.

~~18. The method of claim 17, comprising biasing the first and second gates sections away from one another toward the opposite first and second seats via a biasing mechanism.~~

~~19. The method of claim 17, comprising filling a cavity of the split gate valve with a fluid to test each seal of the double seal at a same time.~~

~~20. The method of claim 17, comprising filing a cavity of the split gate valve with a fluid to isolate the fluid within the cavity.~~