The claimed invention is:

1. A method of generating hydrogen gas, the method comprising:

inserting a reactant material into a reactor;

imparting a force that pressurizes an aqueous solution within a flexible solution chamber; delivering the pressurized aqueous solution with a water feed system via a solution inlet fill port to the reactant material in the reactor to generate hydrogen gas; and,

routing the generated hydrogen gas from the reactor via a hydrogen outlet port to an industrial application.

2. The method of claim 1, wherein the reactant fuel material includes at least one of sodium silicide powder and sodium silica gel.

3. The method of claim 1 the method further comprising providing a check valve to regulate the pressure of the aqueous solution delivered to the reactant fuel material in the reactor based upon characteristics of the flexible solution chamber.

4. The method of claim 1 the method further comprising using a force gauge that measures at least one of water pressure, hydrogen pressure, flexible solution chamber displacement to determine a state of the reaction of the aqueous solution and the reactant fuel material.

5. The method of claim 4, wherein the force gauge includes a microcontroller with a database including at least a look up table to determine the state of the reaction.

6. The method of claim 5 the method further comprising using a pressure sensor to measure the pressure the pressure in the reactor.

7. The method of claim 6 wherein the sensor resides in one of the water supply, the pathway between the water supply and the reactor chamber, and the reactor chamber.

8. The method of claim 1 further comprising using a force gauge that measures at least one of water pressure, hydrogen pressure, flexible solution chamber displacement to determine a state of the reaction of the aqueous solution and the reactant fuel material.

9. The method of claim 1 further comprising using a force gauge that measures at least one of water pressure, hydrogen pressure, flexible solution chamber displacement to determine a state of the reaction of the aqueous solution and the reactant fuel material.

10. The method of claim 9, wherein the force gauge includes a microcontroller with a database comprising at least a look up table to determine the state of the reaction.

11. The method of claim 10 further comprising:
a pressure sensor; and,
wherein the pressure sensor measures the pressure the pressure in the reactor.

12. The method of claim 6 wherein the pressure sensor resides in one of the water supply, the pathway between the water supply and the reactor chamber, and the reactor chamber.

13 The method of claim 1 wherein the imparting a force step comprises imparting a force on the chamber using at least one of a spring mechanism, bellow mechanism, and an external pressurizing source.

14. The method of claim 1 wherein the imparting a force step comprises imparting a force on the chamber using a balloon devices to impart the force.

15. A system for generating hydrogen gas, the system comprising:

a reactor including a solution inlet port and a hydrogen outlet port;

a reactant fuel material added to the reactor; and,

a water feed system with a flexible solution chamber that pressurizes and delivers an aqueous solution via the solution inlet fill port to the reactant fuel material in the reactor to generate hydrogen gas to be routed via the hydrogen outlet port to an industrial application.

16. The system of claim 15, wherein the reactant fuel material includes at least one of sodium silicide powder and sodium silica gel.

17. The system of claim 15 further comprising a balloon device adjacent to the flexible solution chamber and wherein the balloon device can exert a force on the chamber to pressurize the chamber.

The claimed invention is:

1. A system for generating hydrogen gas, the system comprising:

a reactor including a solution inlet port and a hydrogen outlet port;

a reactant fuel material added to the reactor;

a water feed system with a spring and a solution chamber, the spring imparting a force on the solution chamber to pressurize and deliver an aqueous solution via the solution inlet fill port to the reactant fuel material in the reactor to generate hydrogen gas to be routed via the hydrogen outlet port to an industrial application.

2. The system of generating hydrogen gas of claim 1, wherein the reactant fuel material includes at least one of sodium silicide powder or sodium silica gel.

3. The system of generating hydrogen gas of claim 1 further comprising:

a check valve that regulates the pressure of the aqueous solution delivered to the reactant fuel material in the reactor based upon characteristics of the spring.

4. The system of generating hydrogen gas of claim 3, wherein the check valve regulates the pressure of the delivered aqueous solution as a steady decay associated with the spring force.

5. The system of generating hydrogen gas of claim 3, wherein the check valve prevents hydrogen gas from deflecting the spring.

6. The system of generating hydrogen gas of claim 1 further comprising:

a water flow limiter that dampens the pressure of the delivered aqueous solution initially delivered to the reactant fuel material to start or restart a reaction.

7. The system of generating hydrogen gas of claim 1 further comprising:

a viewing window that indicates a volume of the aqueous solution added to the reactor to determine a state of the reaction.

8. The system of generating hydrogen gas of claim 7, wherein the determined state of the reaction includes at least one of an amount of reactant fuel material that has been reacted, an amount of reactant fuel material that remains in the reactor, and an amount of hydrogen gas generated by the reaction.

9. The system of generating hydrogen gas of claim 1 further comprising:

a force gauge that measures at least one of water pressure, hydrogen pressure, spring force, and spring displacement to determine a state of the reaction of the aqueous solution and the reactant fuel material.

10. The system of generating hydrogen gas of claim 9, wherein the force gauge includes a microcontroller with a database to measure at least one of water pressure, hydrogen pressure, spring force, and spring displacement to determine the state of the reaction.

11. The system of generating hydrogen gas of claim 9, wherein the determined state of the reaction includes at least one of an amount of reactant fuel material that has been reacted, an amount of reactant fuel material that remains in the reactor, and an amount of hydrogen gas generated by the reaction.

12. The system of generating hydrogen of claim 9 further comprising:

a display device for displaying the determined state of the reaction.

13. The system of generating hydrogen gas of claim 1, wherein the spring exchanges a volume in the reactor for a volume of the aqueous solution.

14. A method of generating hydrogen gas, the method comprising:

inserting a reactant material into a reactor;

imparting a force on a solution chamber with a spring to pressurize an aqueous solution in the solution chamber;

delivering the pressurized aqueous solution with a water feed system via a solution inlet fill port to the reactant material in the reactor to generate hydrogen gas; and

routing the generated hydrogen gas from the reactor via a hydrogen outlet port to an industrial application.

15. The method of generating hydrogen gas of claim 14, wherein the reactant material includes at least one of sodium silicide powder or sodium silica gel.

16. The system of generating hydrogen gas of claim 14 further comprising:

regulating the pressure of the aqueous solution delivered to the reactant fuel material in the reactor with a check valve, wherein the pressure is regulated based upon characteristics of the spring.

17. The method of generating hydrogen gas of claim 16, wherein regulating the pressure of the aqueous solution with the check valve includes regulating the pressure of the delivered aqueous solution as a steady decay associated with the spring force.

18. The method of generating hydrogen gas of claim 16 further comprising:

preventing hydrogen gas from deflecting the spring.

19. The method of generating hydrogen gas of claim 14 further comprising:

dampening the pressure of the delivered aqueous solution initially delivered to the reactant fuel material to start or restart a reaction with a water flow limiter.

20. The method of generating hydrogen gas of claim 14 further comprising:

measuring a volume of aqueous solution added to the reactor; and

determining a state of the reaction based upon the measured volume of aqueous solution added to the reactor.

21. The method of generating hydrogen gas of claim 20, wherein the determined state of the reaction includes at least one of an amount of reactant fuel material that has been reacted, an amount of reactant fuel material that remains in the reactor, and an amount of hydrogen gas generated by the reaction.

22. The method of generating hydrogen gas of claim 14 further comprising:

measuring at least one of water pressure, hydrogen pressure, spring force, and spring displacement with a force gauge; and

determining a state of the reaction of the aqueous solution and the reactant fuel material based upon at least one of the measured water pressure, hydrogen pressure, spring force, and spring displacement.

23. The method of generating hydrogen gas of claim 22, wherein the force gauge includes a microcontroller with a database to measure at least one of water pressure, hydrogen pressure, spring force, and spring displacement to determine the state of the reaction.

24. The method of generating hydrogen gas of claim 22, wherein determining the state of the reaction includes determining at least one of an amount of reactant fuel material that has been reacted and an amount of reactant fuel material that remains in the reactor.

25. The method of generating hydrogen of claim 22 further comprising:

displaying the determined state of the reaction with a display device.

26. The method of generating hydrogen gas of claim 14 further comprising:

exchanging a volume in the reactor for a volume of the aqueous solution with the spring.

27. A system for generating hydrogen gas, the system comprising:

a reactor including a solution inlet port and a hydrogen outlet port;

a reactant fuel material added to the reactor;

a water feed system with an elastomeric solution chamber that pressurizes and delivers an aqueous solution via the solution inlet fill port to the reactant fuel material in the reactor to generate hydrogen gas to be routed via the hydrogen outlet port to an industrial application.

28. A method of generating hydrogen gas, the method comprising:

inserting a reactant material into a reactor;

imparting a force from an elastomeric solution chamber that pressurizes an aqueous solution in the solution chamber;

delivering the pressurized aqueous solution with a water feed system via a solution inlet fill port to the reactant material in the reactor to generate hydrogen gas; and

routing the generated hydrogen gas from the reactor via a hydrogen outlet port to an industrial application.