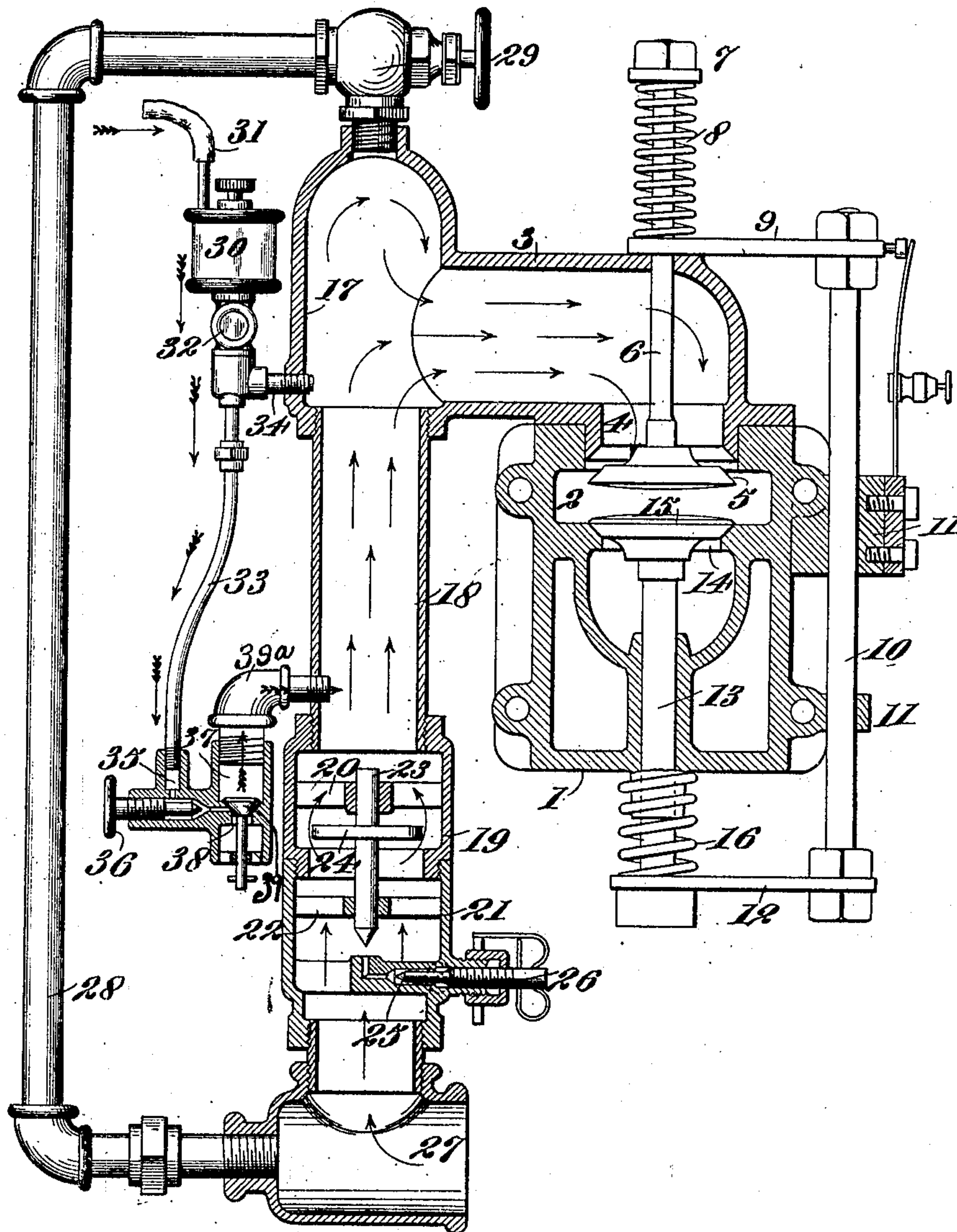


No. 871,288.

PATENTED NOV. 19, 1907.

J. B. MERWIN.
GAS SATURATING DEVICE.
APPLICATION FILED FEB. 18, 1907.



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UNITED STATES PATENT OFFICE.

JOHN B. MERWIN, OF ST. LOUIS, MISSOURI.

GAS-SATURATING DEVICE.

No. 871,288.

Specification of Letters Patent.

Patented Nov. 19, 1907.

Application filed February 18, 1907. Serial No. 357,968.

To all whom it may concern:

Be it known that I, JOHN B. MERWIN, a citizen of the United States, residing at St. Louis, Missouri, have invented a new and useful Gas-Saturating Device, of which the following is a specification.

This invention relates to gas saturating devices, such as are adapted for use to saturate fuel gas with moisture, and it consists of the novel construction, combination and arrangement of parts herein shown, described and claimed.

The object of this invention is to provide a device for use with explosive gas engines whereby the gas passing to the explosion or combustion chamber will be mixed or saturated with vaporized or sprayed moisture, both of said elements being commingled thoroughly in a mixing chamber which constitutes a part of the passage leading from the source of supply of each of said substances to the combustion or delivery chamber or outlet. The mechanism is arranged so that the requisite or desired quantities of the two substances come together from intersecting passages so that thenceforward they move together within a passage or chamber whose outlet is controlled by suitable valves thereby causing proper convolutions of the vaporous or gaseous elements as required to mix them thoroughly together. The explosive power or force of the gas is improved by proper saturation thereof, especially saturation as efficiently effected by this mechanism.

There are other objects which will appear from the following description, reference being made to the accompanying drawing which is a sectional view illustrating a satisfactory embodiment of my invention as adapted for use in connection with engines, locomotives and like mechanisms.

A casting 1 formed with a chamber 2 which leads or opens into the cylinder of the engine (not shown). A hollow casting 3, constituting a passageway, is provided with an elbow 4 leading into the chamber 3. A valve plate 5 is attached to the lower end of a stem 6 which projects through the wall of the casting 3, and is operable to open and close the passageway and thereby to regulate the ingress of the gas or other agent. A nut or washer 7 is attached to the external end of the valve stem 6 and a spring 8 encircles the valve stem, abutting against the nut or washer at one end and against an arm 9 at the other end. The arm 9 is attached to a

bar 10 supported in bearings 11 on the casting 1 and movable axially or longitudinally as required to compress the spring 8 and thereby move the valve stem and the valve 5 thereon. The opposite end of the bar 10 carries an arm 12, corresponding to the arm 9, the other end of which is attached to the protruding end of a valve stem 13 operating into the casting 1. An outlet or exhaust passage 14 leads from the chamber 2 and is controlled, that is to say is opened and closed, by a valve 15 attached on the interior end of the valve stem 13. A strong spring 16 encircles the external or protruding end of the valve stem 13 between the wall of the casting 1 and the arm 12, thereby actuating the latter away from the casting and holding the valve 15 in position to close the exhaust passage or outlet 14.

When the valve 15 is seated in the passage 14 the arm 9 is held against the casting 1 and the spring 8 is expanded thereby permitting the valve 5 to remain out of the inlet passage and said passage to remain open. Assume that, at the proper time and at predetermined intervals the bar 10 is moved axially in opposition to the springs 8 and 16. In so moving the said bar moves the valve stem 13 and opens the outlet or exhaust passage 14, and also compresses the spring 8 thereby moving the valve stem 6 which draws the valve 5 into the inlet passage and closes the same. By this alternate opening and closing of said passages the gas is admitted in proper quantities and the products of combustion or explosion are permitted to pass out to make room for the next operation. While I have shown no means for thus reciprocating the bar 10 to effect these operations, it will be readily understood that it may be accomplished in any of the well known ways, such, for instance, as by the piston connections.

The casting 3 at the end opposite from the casting 1 has a large chamber 17 into one side of which a large pipe 18 leads. A valve chamber 19 is attached to the end of the pipe 18, and has cross pieces 20 thereon. Another chamber 21 communicates with the chamber 19 and has similar cross pieces 22 therein. A valve stem 23 operates through said cross pieces and a plate 24 is attached on said valve stem, and closes the opening into said chamber when in idle position and when in use forms a baffle for the in-passing air and gas or gasoline and serves to distrain or sepa-

rate the entrained substances therefrom. Suction created within the pipe 18 by the piston in the cylinder raises the plate 24. An inlet passage 25 admits gasolene or gas into the chamber 25 and is controlled by a suitable valve device 26. The passage 25 opens in axial alinement with the conical end of the valve stem 23 so that, when idle, the said valve stem becomes seated in the passage and shuts off the passage of gasolene and gas. The chamber 21 is provided with a large air inlet 27 below the gas inlet 25 so that inrushing air takes up and carries on the gas or gasolene. A pipe 28 leads from the inlet 27 to the chamber 17 and is controlled by a valve 29, so that air may be admitted direct into said chamber before being mixed or saturated with the gas. This does not interfere with the admission of air into the chamber 21 to carry the gas, but permits pure air to be admitted during the course of the gas saturated air to the engine.

Water is admitted to a receptacle 30, through a supply pipe 31 leading from any suitable source of supply, and thence through a sight feed 32 into a pipe 33. A support 34 connects said pipe with the chamber 17. The lower end of the pipe 33 opens and discharges into a valve chamber 35 whence the passage of the water is regulated by a manually operable valve 36. The valve chamber 35 opens into a chamber 37 having an outlet passage 38 for emission of surplus water. A valve 39 is located in the chamber 37 and closes the passage leading from the valve chamber 35 and also the discharge outlet 38. If raised by suction or otherwise, however, said valve opens both passages and permits free passage of the water, the supply of which is regulated by the valve 36. An elbow 39^a connects the chamber 37 with the pipe 18 into which the incoming gas enters and the water and gas there become saturated and entrained one with the other, and are drawn onward to the engine cylinder or point of delivery. The gas and water are turned over and over in waves or convolutions by the angles of the passageway 3 and also within the chamber 17 where the mixed elements are permitted more or less circulation. When desired air may be admitted into this chamber with the entrained gas and water and accompany said elements onward to their delivery.

In operation with an engine the reciprocating piston acts suctionwise upon the contents of the chamber 2. When a quantity of the saturated gas enters said chamber it is drawn into the cylinder and there ignited and exploded as required to perform its functions. At or just prior to the time of the explosion the bar 10 should be moved to close the inlet passage and open the passage 14 for a sufficient time for the products of explosion and

combustion to pass out so that the cylinder will be clear for a fresh charge. As described hereinbefore the operation of the valves may be made automatic in connection with the piston.

This mechanism is adapted for use particularly with engines wherein high power is desired and obnoxious products of combustion are not desired, such, for instance as engines and locomotives for use in mines. It may as readily be used with two cycle or four cycle engines and its adaptability to either species will be readily understood by those skilled in the art to which it pertains. There may be many variations and alterations from the arrangement and construction described and illustrated, within equivalent limits, without departing from the spirit and scope of my invention.

I do not restrict myself to exact details or features of arrangement or construction, but

What I claim and desire to secure by Letters Patent, is:

1. An apparatus of the character described comprising a chamber, an air and gas inlet passage opening into said chamber, means for admitting water into said passage to saturate the gas, a chamber in which the water and gas are mixed and means for admitting air into the said last-named chamber, substantially as specified.

2. An apparatus of the character described comprising a passageway, means for admitting gas into said passageway, means for admitting water into said passageway, an enlarged chamber located on said passageway, and a valve controlled delivery chamber beyond the said enlarged chamber, substantially as specified.

3. An apparatus of the character described comprising a pipe, means for admitting gas into said pipe, a baffle plate in said pipe, means for admitting water into said pipe, an enlarged chamber located on said passageway, and a valve controlled delivery chamber beyond the said enlarged chamber, substantially as specified.

4. An apparatus of the character described, comprising a passageway, means for admitting gas and water into said passageway, an enlarged chamber located on said passageway a delivery chamber having inlet and outlet passages, a valve controlling each of said passages, and a single controlling device for operating all of said valves, substantially as specified.

In testimony whereof, I hereunto affix my signature to this specification this 12th day of January 1907, in the presence of two witnesses.

JOHN B. MERWIN. [L. S.]

Witnesses:

F. J. McCASLIN.

J. D. RIPPEY.