

No. 729,377.

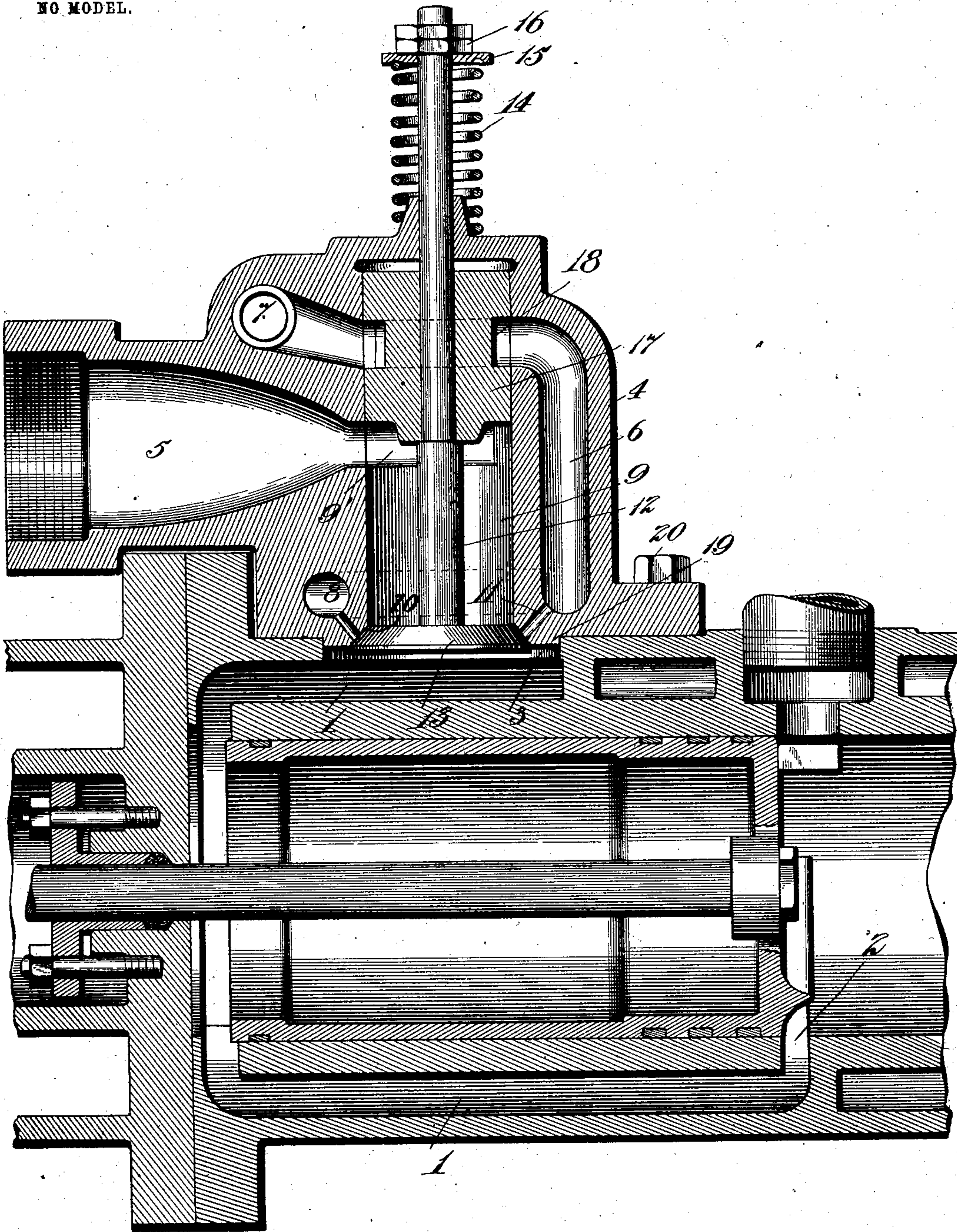
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W. F. MEISTER & W. S. PATTIN.

COMBINED GOVERNOR AND GAS AND AIR MIXER FOR EXPLOSIVE ENGINES.

APPLICATION FILED SEPT. 30, 1902.

NO MODEL.



WITNESSES:

Geo. P. Kingsbury.
Harrison B. Brown

INVENTORS

William F. Meister.
Winfield S. Pattin.
BY *Munn & Co.*

ATTORNEYS.

UNITED STATES PATENT OFFICE.

WILLIAM F. MEISTER AND WINFIELD S. PATTIN, OF MARIETTA, OHIO,
ASSIGNORS TO THE PATTIN BROTHERS COMPANY, OF MARIETTA,
OHIO, A CORPORATION OF OHIO.

COMBINED GOVERNOR AND GAS AND AIR MIXER FOR EXPLOSIVE-ENGINES.

SPECIFICATION forming part of Letters Patent No. 729,377, dated May 26, 1903.

Application filed September 30, 1902. Serial No. 125,406. (No model.)

To all whom it may concern:

Be it known that we, WILLIAM F. MEISTER and WINFIELD S. PATTIN, citizens of the United States, residing at Marietta, in the county of Washington and State of Ohio, have invented certain new and useful Improvements in a Combined Governor and Gas and Air Mixer for Explosive-Engines, of which the following is a specification.

Our invention relates to explosive-engines, and the invention consists of a peculiar governor-valve adapted to feed a measured quantity of explosive mixture to the compression-chamber.

The invention also consists of the special details of construction hereinafter fully described, with the novel features pointed out in the claims.

In order to enable others skilled in the art to make and use our invention, we will now proceed to describe its construction and operation with reference to the accompanying drawing, forming a part of this specification.

The figure shown by the drawing illustrates a central vertical longitudinal section through our invention and part of a gas-engine cylinder.

It will be apparent that our invention, which is in nature a valve, is adapted to any compression type of explosive-engine. Since such engines are well understood, we deem a detailed description of the cylinder shown unnecessary, and therefore we will only refer to such parts of the said cylinder as will make clear our invention as applied thereto.

In carrying out our invention we employ an automatic valve adapted to feed air and gas to a compression-space, shown by our drawing as a jacket-space 1, which constitutes the compression-chamber, and, as shown, extends around one end of the cylinder. The explosive mixture passes to the explosive end of the cylinder through an inlet-port 2 of common and well-known form.

With an engine employing a cylinder as above described in adapting our invention thereto we cut away the outer wall of the jacket, providing an opening 3, forming communication through our improved governor-

valve with the compression-chamber above referred to.

In the make-up of our invention we employ a body portion 4, having an air-passage 5 and a gas-passage 6. The air-passage 5 may open direct with the outer air or be screw-threaded, as shown, adapted to form connection with the threaded end of an air-pipe. (Not shown.) The gas-passage 6 extends along and just within the outer walls of the body portion 4, from a gas-feed pipe 7, down to and communicates with an annular space 8, encircling the open end of a piston-chamber 9. The open end of the chamber 9 is fashioned into a valve-seat 10, having a series of jet-openings 11, providing gas-outlets from the said annular space 8. Within the chamber 9 we arrange a stem 12, having at its lower end a valve 13 and with its upper end projecting through the body portion 4, adapted to have arranged thereon a spring 14. The latter is confined between the body portion 4 and a suitable washer 15, held by nuts 16, threaded upon the extreme end of the said stem, as shown. Within the chamber 9, which may be enlarged; as at 9', we arrange a piston 17, having a reduced portion 18, forming an annular gas-passage around the piston. The special gas-passage just described, formed by the reduced portion 18, as stated, may be dispensed with or modified without departing from the spirit of our invention. The piston 17 is supported on a reduced portion of the stem 12, as shown, adapted when the valve 13 is on its seat 10 to afford maximum feed of gas and air, respectively, to the passage 6 and the chamber 9.

It will be noticed that the lower surface of the body portion 4 is provided with a suitable offset 19, adapted to fit into the opening 3 in the side walls of the compression chamber or jacket 1. The body portion can be secured in place by tap-bolts 20, extended into the outer walls of the compression-chamber, or by other obvious means adapted thereto. With the above-described construction of parts and the arrangement thereof it is apparent that upon a backward stroke of the engine-piston a vacuum effect will be produced in

the compression-chamber 1 operating to draw and unseat the valve 13, with an obvious inrush of air through the opening 5 and chamber 9. At the same time gas will be forced
 5 through the passage 6 into the annular passage 8 and out through the jet-openings 11, meeting and mingling with the air, and thereby insuring a thorough mixture. The amount of explosive mixture fed into the com-
 10 pression-chamber 1 is governed by the tension of the spring 14. Should the engine speed beyond desired rapidity of stroke, increased vacuum would be formed in the compression-chamber, effecting to draw down or
 15 unseat the valve 13. The piston 17 being fixedly secured to the valve-stem 12, it is apparent when the valve 13 is unduly opened that it would move with the valve 13, and thereby correspondingly cut off or throttle
 20 the supply of gas and air. Under normal conditions the tension of the spring will insure movement of the valve 13 and the piston 17, such as will allow only enough air and gas to pass into the combustion-chamber
 25 adapted to maintain a continuous and uniform stroke of the engine-piston.

Our invention involves special novelty in its simplicity of parts and improved means for feeding and mixing the air and gas that
 30 is not liable to get out of order or be disarranged by an unskilled attendant.

Having thus fully described our invention, what we claim as new, and desire to secure by Letters Patent, is—

35 1. In combination with an explosive-engine, a gas and air cut-off or throttle consisting of a body portion having a piston-chamber opening direct into the compression-chamber of the engine, an air-inlet leading into the
 40 said piston-chamber, a gas-inlet leading into the said piston-chamber and also down into an annular space around the lower or open end of the said piston-chamber, a downwardly-movable spring-retained valve seated
 45 at and closing the lower end of the piston-chamber, a series of jet-openings leading through the said valve-seat from the annular space around the lower end of the piston-chamber, and with their lower or open ends
 50 adapted to be closed by the said valve when it is on its seat, and a piston adapted to move

with the said valve operating to cut off or throttle the supply of gas and air, substantially as described.

2. In combination with an explosive-en- 55
 gine, a valve-chamber opening into the compression-chamber of the engine, a yielding piston-valve in said valve-chamber operating to cut off, wholly or partially, supply of gas and at the same time, partially cut off the 60
 supply of air, an upwardly-seating yielding valve adapted to simultaneously cut off supply of air and gas at the compression-chamber opening of the said valve-chamber, a com- 65
 mon valve-stem to which the said upwardly-seating and piston valves have fixed connection, and a spring on the upper or projecting end of the said valve-stem having tension- 70
 adjusting means, substantially as described.

3. In combination with an explosive-en- 75
 gine, means operating to cut off or throttle gas and air supply, according to more or less vacuum produced in the compression-chamber, the said cut-off means consisting of a casing having an inner chamber with inlet 75
 and outlet gas and air passages and openings as specified, a valve-stem in the said inner chamber having its upper end projected through the said casing, a regulating-spring, on the projected end of the said stem, a pis- 80
 ton-valve within the said inner chamber on the said stem, and a lower upwardly-seating valve united to and moving with the said piston-valve, substantially as described.

4. In combination with an explosive-en- 85
 gine, a gas and air cut-off employing a casing having an inner chamber, in direct communication with the engine compression-chamber and also inlet and outlet passages, and openings closed by a lower valve as specified, a 90
 piston in the said inner chamber united to and moving with said lower valve, the said piston being adapted in operation to cut off or throttle gas and air passages to the said lower valve according to the more or less 95
 vacuum produced in the compression-chamber of the engine substantially as described.

WILLIAM F. MEISTER.

WINFIELD S. PATTIN.

Witnesses:

BENJAMIN B. PUTNAM,

BERT E. MOSES.