

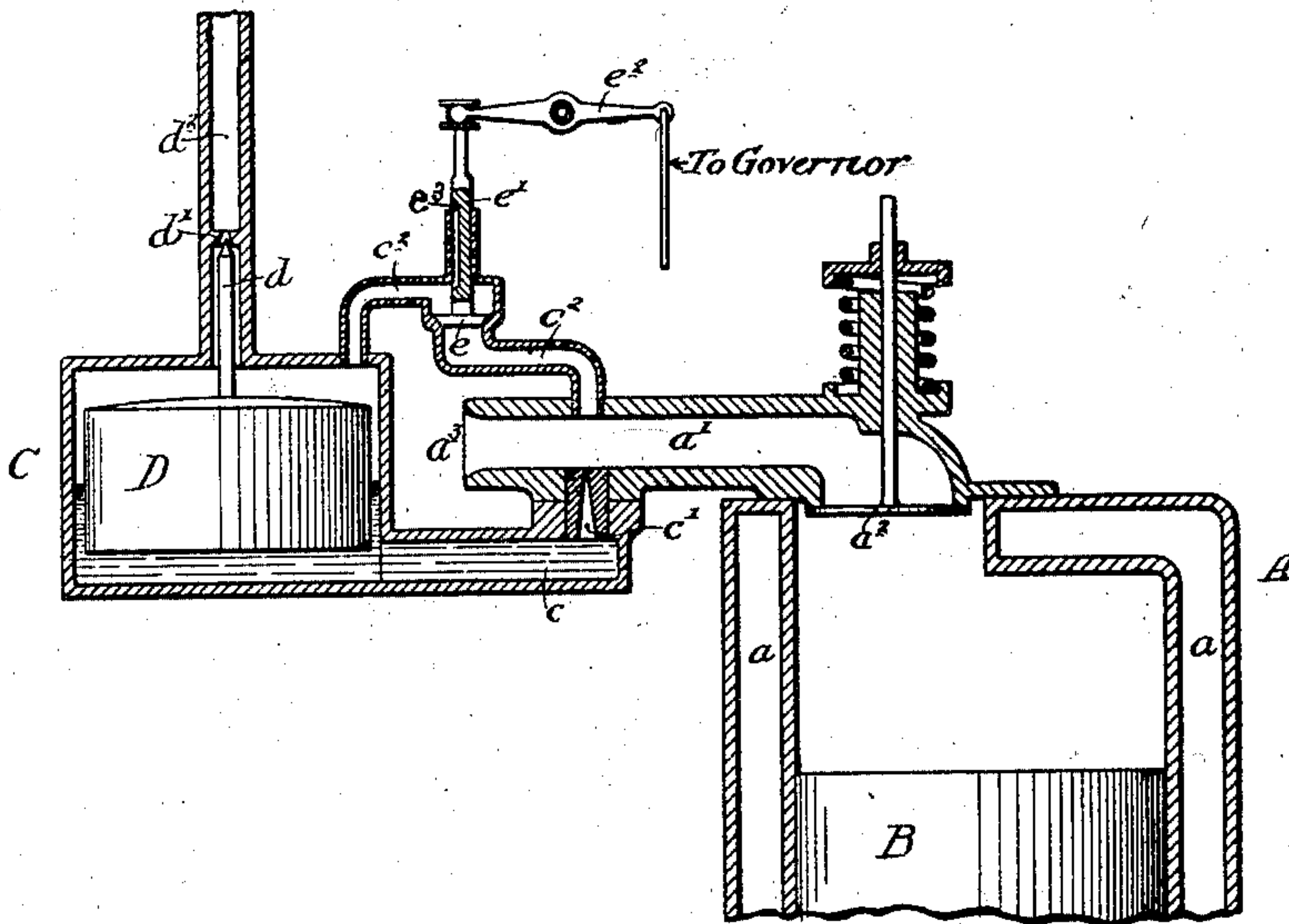
No. 686,101.

Patented Nov. 5, 1901.

W. A. MAYBACH.  
REGULATION DEVICE FOR EXPLOSION MOTORS.

(Application filed Mar. 28, 1901.)

(No Model.)



Witnesses:

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# UNITED STATES PATENT OFFICE.

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## REGULATION DEVICE FOR EXPLOSION-MOTORS.

SPECIFICATION forming part of Letters Patent No. 686,101, dated November 5, 1901.

Application filed March 28, 1901. Serial No. 53,346. (No model.)

*To all whom it may concern:*

Be it known that I, WILHELM A. MAYBACH, a subject of the Emperor of Germany, and a resident of Cannstadt, in the Kingdom of Würtemberg, Germany, have invented certain Improvements in Regulation Devices for Explosion-Motors, of which the following is a specification.

My invention relates to certain improvements in governing mechanism for gas or explosion motors, having for its object the provision of a device operated by a suitable centrifugal governor which shall regulate the quantity of liquid combustible drawn into the cylinder on the charging stroke of the engine and which shall be simple in construction and reliable in action. These objects I attain as hereinafter described, reference being had to the accompanying drawing, in which the figure is a longitudinal sectional view of the upper portion of an explosion-motor, showing my improved device used in connection with the carbureter and the passages connecting the same with the engine-cylinder.

In the drawing, A is the cylinder of the engine, in which operates a piston, the upper part of the same being shown at B. The cylinder in the present case has a water-jacket  $a$  and a passage  $a'$  extending from its end, in which is situated a spring-controlled inlet-valve  $a^2$ , constructed to be periodically operated by any suitable mechanism known to the art.

C is a casing having in it a float D, to which is attached a valve  $d$ , constructed to fit a valve-seat  $d'$  in a passage  $d^2$ , leading from a reservoir for the liquid combustible to the said casing. A passage  $c$  connects the casing C with the inlet-passage  $a'$  through the injector  $c'$ , the float D acting in the well-known manner to keep the combustible in the casing at a constant level. Extending from the upper part of the said casing is an auxiliary passage  $C^2$ , also connecting between it and the passage  $a'$ , there being a valve  $e$  constructed to fit a suitable seat in said passage. To the spindle  $e'$  of this valve is attached the lever  $e^2$ , properly connected to a centrifugal or other speed governor and constructed to open the valve  $e$  when the speed

of the engine rises above a certain predetermined point. The stem  $e'$  of the valve has in it a groove  $e^3$ , so placed that when the valve is closed it forms communication between the upper portion of the casing C and the atmosphere, this connection being cut off as soon as the valve is opened. The outer end of the passage  $a'$  is open to the atmosphere through the space  $a^3$ .

In operation on the charging stroke of the piston B air is drawn through the passage  $a'$ , the valve  $a^2$  being open. This flow of air sucks the combustible fluid from the injector  $c'$  in a fine spray, mixing with the same, and after being compressed is exploded in the well-known manner common to by far the greater number of gas-engines. The groove in the valve-stem  $e'$  allows air to enter the casing C in order that the fluid may be free to flow from it out of the injector. As the speed of the engine reaches and finally passes the predetermined point for which it was designed the governor operates upon the lever  $e^2$ , opening the valve  $e$  and forming connection between the passage  $a'$  and the upper part of the casing C. When on the next charging stroke air is drawn into the cylinder A, little or no combustible fluid will be drawn through the injector in view of the fact that the pressure is approximately the same within the casing and at the said injector. It will be noted that the act of opening the valve  $e$  cuts off the communication of the interior of the casing with the atmosphere in order that pressure on the two surfaces of the combustible may be equal and that the amount of said liquid drawn through the injector may depend upon the amount of opening of the valve  $e$ . The partial cutting off of the combustible fluid or the extreme dilution of the mixture drawn into the engine-cylinder so reduces the force of the explosion that the speed of the engine is quickly and surely reduced until a point has been reached where the valve is closed and combustible fluid is again sucked in full stream from the injector.

I claim as my invention—

1. The combination of an engine-cylinder, a piston, a casing connected to a reservoir for combustible fluid, means in the casing for



regulating the level of fluid therein, a passage connecting one end of the engine-cylinder with the atmosphere, a valve therein, an injector connected with the casing opening into  
5 said first passage, a second passage connecting the top part of the casing and the first passage and a valve in said second passage, substantially as described.

2. The combination of an engine-cylinder,  
10 a piston therein, a passage extending from one end of said cylinder, with a casing connected to a reservoir for liquid fuel, and two passages connecting said casing with the passage from the cylinder, one of said passages extending  
15 from the bottom of the casing and having at its end an injector, the other extending from the top of said casing and having in it a valve controlled by a speed-governor, substantially as described.

20 3. The combination with a gas-engine of the character described, of a casing, a float and a valve therein, a passage connecting said casing with the main inlet-passage of the engine, an auxiliary passage also connecting the  
25 casing with said inlet-passage, a valve in said

passage and means connected to the valve whereby the interior of the casing is put in communication with the atmosphere when said valve is closed and cut off therefrom when the valve is open, substantially as described. 30

4. The combination of a cylinder, a piston, a casing connected to a reservoir for liquid fuel, means in the casing for keeping the fuel at a constant depth therein, a passage connecting one end of the said cylinder with the  
35 atmosphere, an auxiliary passage connecting the casing and said first passage, a valve therein, a valve-rod supporting the same and a passage in the said rod connecting the interior of the casing with the atmosphere when  
40 the said valve is closed and constructed to cut off said communication when the valve is opened, substantially as described.

In testimony whereof I have signed my name to this specification in the presence of  
45 two subscribing witnesses.

WILHELM A. MAYBACH.

Witnesses:

WM. HAHN,

H. E. REICHARDT.