

No. 725,741.

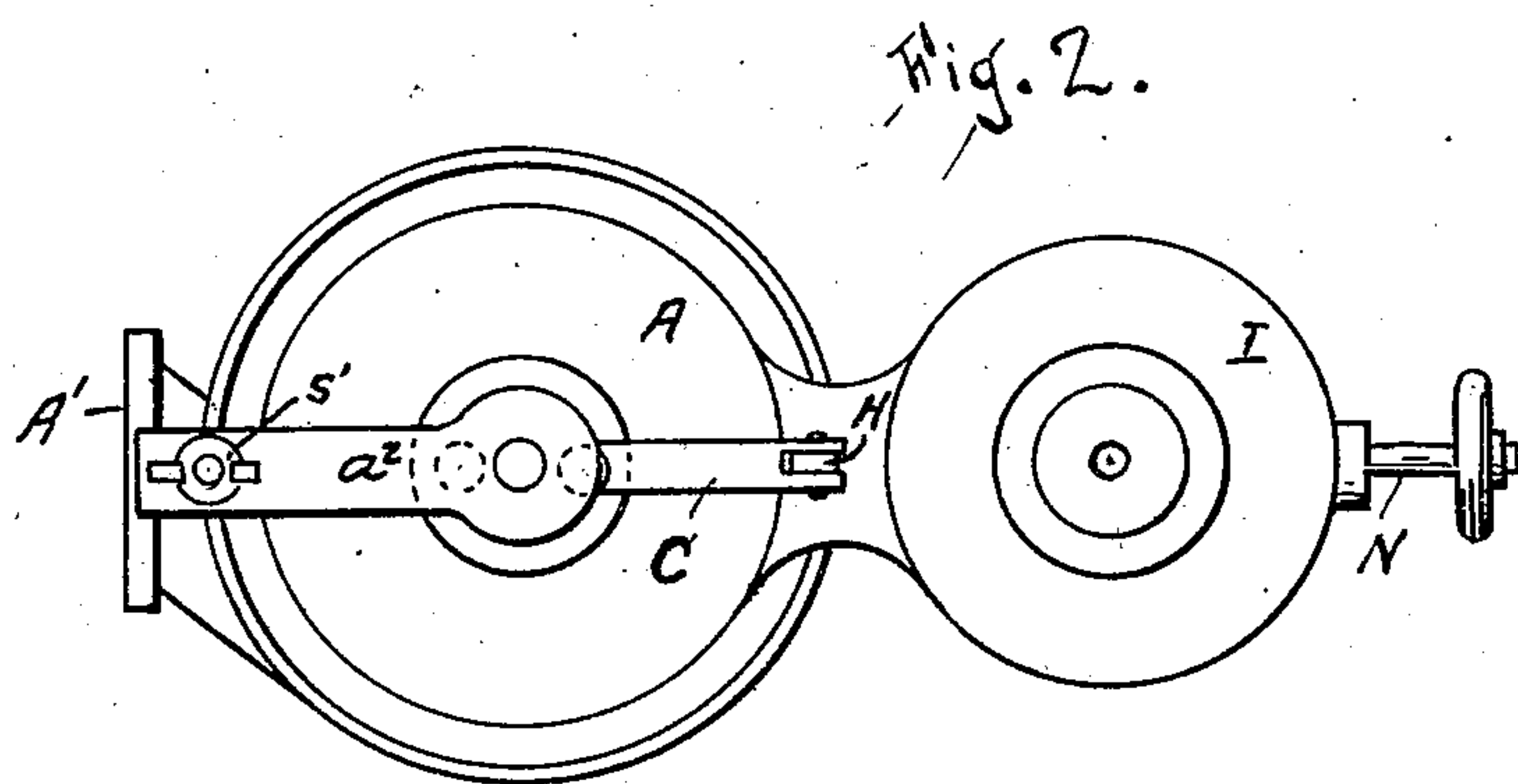
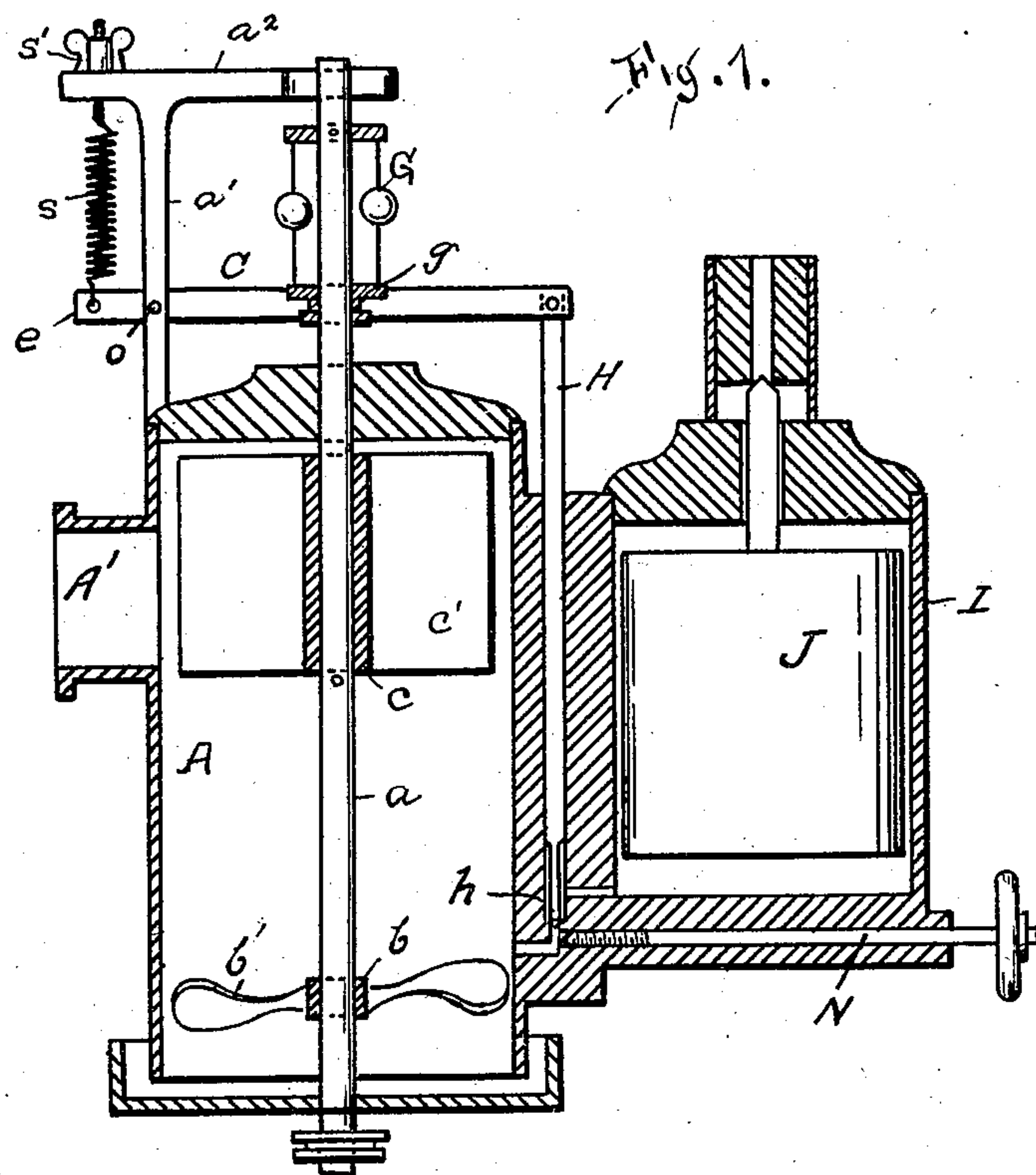
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C. A. MILLER.

FUEL FEED REGULATOR FOR EXPLOSIVE ENGINES.

APPLICATION FILED MAR. 1, 1902.

NO MODEL.



Witnesses  
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# UNITED STATES PATENT OFFICE.

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## FUEL-FEED REGULATOR FOR EXPLOSIVE-ENGINES.

SPECIFICATION forming part of Letters Patent No. 725,741, dated April 21, 1903.

Application filed March 1, 1902. Serial No. 96,218. (No model.)

*To all whom it may concern:*

Be it known that I, CHARLES A. MILLER, a citizen of the United States, residing at Reading, in the county of Berks and State of Pennsylvania, have invented certain new and useful Improvements in Fuel-Feed Regulators for Explosive-Engines; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

This invention relates to improvements in fuel-feed regulators for explosive-engines; and the object of the invention is to provide a device whereby the flow of liquid is automatically regulated by the speed of the engine to which the device is applied and one in which the liquid is thoroughly mixed with the air by a churning action prior to its delivery to the explosion-chamber.

My device is what I term a "fuel-feed regulator," adapted to supply a varying amount of fuel to the engine according to the rate of speed at which it is running—that is, as the speed of the engine increases the demand for a greater supply of fuel increases, and as the speed decreases the demand lessens. To meet these conditions, I have constructed a device especially adapted for the purpose, which is operated entirely by the speed of the engine, while the speed of the engine itself is regulated in any desired manner, either by a supplemental governor or throttle. The operation of the throttle or governor to decrease the speed of the engine will affect the fuel-feeding device, and the feeding-valve in said device being gradually closed as the rate of speed decreases supplies only enough fuel to keep the engine running steady. With the increased speed the feeding-valve is opened, and an increased amount of fuel is fed to the vaporizer for the same purpose.

The invention is fully described in the following specification and is clearly illustrated in the accompanying drawings, in which—

Figure 1 is a vertical sectional view, and Fig. 2 a plan view, of my device.

The device consists of a mixing-chamber A, provided with an open base, beneath which is supported the usual cap or pan which permits air to be drawn into the chamber. Said

chamber is also provided with a vertical rod or shaft *a*, passing therethrough, to which are secured two fans *b* and *c*, which are located near the top and bottom of the chamber, the lower fan *b* having curved blades *b'* and the upper one having straight blades *c'*. To the exterior of the chamber A and at the top thereof is arranged an upright post *a'*, having a right-angled arm *a''*, in which the end of the rod *a* is mounted. To this upright post is pivoted a lever C at a point *o*, and the rear end *e* thereof is adjustably connected to the arm *a''* by means of a coiled spring *s* and a thumb-screw *s'*. On the rod *a* above the chamber A is mounted a governor G, to the lower sliding portion or collar *g* of which is loosely connected this lever C at about its center, its inner end being pivotally connected to a depending valve-rod H. The chamber A has a flaring outlet A' at its rear. A supplemental chamber I, somewhat smaller than the mixing-chamber A, is located adjacent thereto and communicates with said chamber A. This supplemental chamber carries a float J, which is provided with a stem extending from its upper face and acts as an ordinary valve to stop the flow of liquid when the supply-chamber is full. Another purpose of said float is to keep the pressure on the liquid uniform no matter how the vehicle on which the device is placed may tilt. This chamber is used as a feed-chamber. The valve-rod H passes between these two chambers and enters the feed-opening *h* to the mixing-chamber and is met at this point by the point of the feed-needle N, which enters along the under side of said chamber I and by means of which the supply is closed entirely when desired. This valve-rod is provided at its lower end with a valve of the ordinary type, so constructed as to allow a small quantity of liquid to flow into the mixing-chamber, but when raised or operated opens the passage to a greater extent.

The thumb-screw *s'* is set so that the lever C will through the valve-rod H regulate the feed-opening *h* sufficiently to permit the proper flow, and the increased speed of the engine will cause the governor through its connection with the lever C to raise said lever on its pivotal point O, thus raising the valve-rod H and opening the feed *h*, thus



permitting the flow of liquid to be increased, and the fans in the mixing-chamber will of course operate with proportionate increased speed. Thus it will be seen that the flow of liquid and the mixing of it with air prior to its delivery to the explosion-chamber are always governed by the demand therefor—namely, by the speed of the engine.

When the fluid enters the mixing-chamber A, the revolving fans will thoroughly mix it with air by their action, one along the vertical central line of the chamber and the other directly across the path thus given it, thoroughly vaporizing it and sending the vapor to the explosion-chamber through the outlet A'. The lower fan *b* serves as a beater and agitator and forces the vapor upward toward the fan *c*, which latter fan also mixes the vapor and air and forces the same through the opening A'. This construction allows a thorough mixing of the vapor and air between the fans, after which it is forced out of the mixing-chamber and into the explosion-chamber.

No matter what the speed of the engine, after the supply has been properly regulated the supply of liquid will always be in proportion to said speed, and the vaporization will necessarily be produced in such manner that the proper proportions of liquid and air will be secured.

Having thus fully described the invention, what I claim, and desire to secure by Letters Patent, is—

1. A vaporizer, comprising a feeding-chamber, a float therein and a valve operated by said float, a mixing-chamber communicating with the feeding-chamber, and provided with an outlet, a positively-driven shaft in said mixing-chamber, a series of fans mounted on said shaft, a regulating-valve between said chambers, a governor mounted on the revolving shaft, connections between said governor and valve for automatically operating the same and a needle-valve adapted to open or close the passage between the chambers.

2. A vaporizer, comprising a feeding-chamber, a float therein, and a valve operated by said float, a mixing-chamber communicating with the feeding-chamber and provided with an outlet, a positively-driven shaft in said mixing-chamber, a pair of fans mounted on said shaft, for mixing the vapor and air, one near each extremity of the chamber, the upper fan also serving as a means for driving the vapor into the explosion-chamber, a valve between the two chambers, means connected to the rotating shaft for automatically oper-

ating said valve, and means for closing the supply-inlet to the mixing-chamber.

3. A vaporizer, comprising a feeding-chamber, a float therein, and a valve operated by the float, a mixing-chamber communicating with the feeding-chamber, and provided with an outlet, a positively-driven shaft in said mixing-chamber, a fan secured to said shaft near the bottom of the chamber and below the feed-opening, for forcing the vapor upward, a second fan mounted on the shaft near the top of said chamber, one of said fans revolving along the vertical center line of the chamber and the other across the path formed thereby, and means for automatically regulating the supply of liquid to the mixing-chamber, and means for closing the supply-inlet to said mixing-chamber.

4. A vaporizer comprising a feeding-chamber, a float therein, and a valve operated by the float, a mixing-chamber communicating with the feeding-chamber, an outlet near the top thereof and an air-inlet near its base, a positively-driven shaft in the mixing-chamber, a fan secured to the shaft near the bottom of the chamber below the feed-opening, and above the air-inlet, for drawing air into said chamber and forcing the vapor and air upward, a second fan mounted on the shaft above the first fan, one of said fans revolving along the vertical center line of the chamber and the other across the path formed thereby, and means for automatically regulating the supply of liquid to the mixing-chamber, and means for closing the supply-inlet to said mixing-chamber.

5. A vaporizer, comprising a mixing-chamber provided with inlet and outlet passages, a positively-driven shaft mounted therein, mixing-blades secured to said shaft, a feed-chamber communicating therewith, a needle-valve in the opening between the chambers, a valve-rod between the chambers, a standard secured to the exterior of the mixing-chamber, a governor on the rotating shaft, a lever connected at one end to the valve-rod and pivoted near its other extremity to the standard, and a connection between the governor and the lever, at a point intermediate of the ends of the latter, for automatically regulating the supply of liquid to the mixing-chamber.

In testimony whereof I affix my signature in presence of two witnesses.

CHARLES A. MILLER.

Witnesses:

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MONROE S. EBY.