No. 785,558. PATENTED MAR. 21, 1905.

A. KREBS.

OIL ENGINE.

APPLICATION FILED SEPT. 26, 1903.

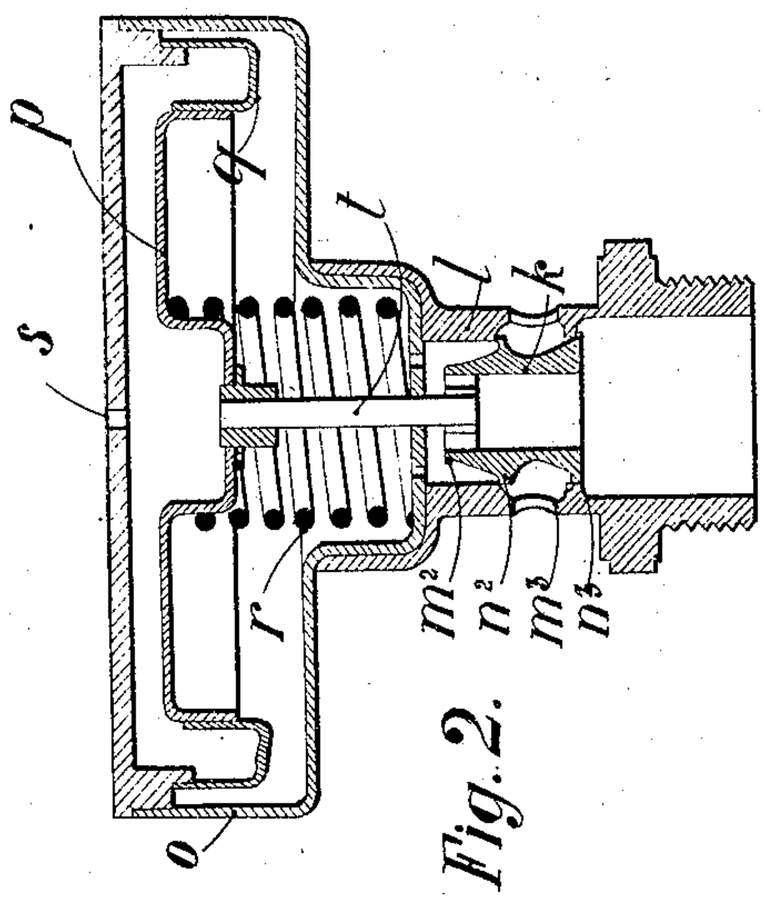

Fig. 2.

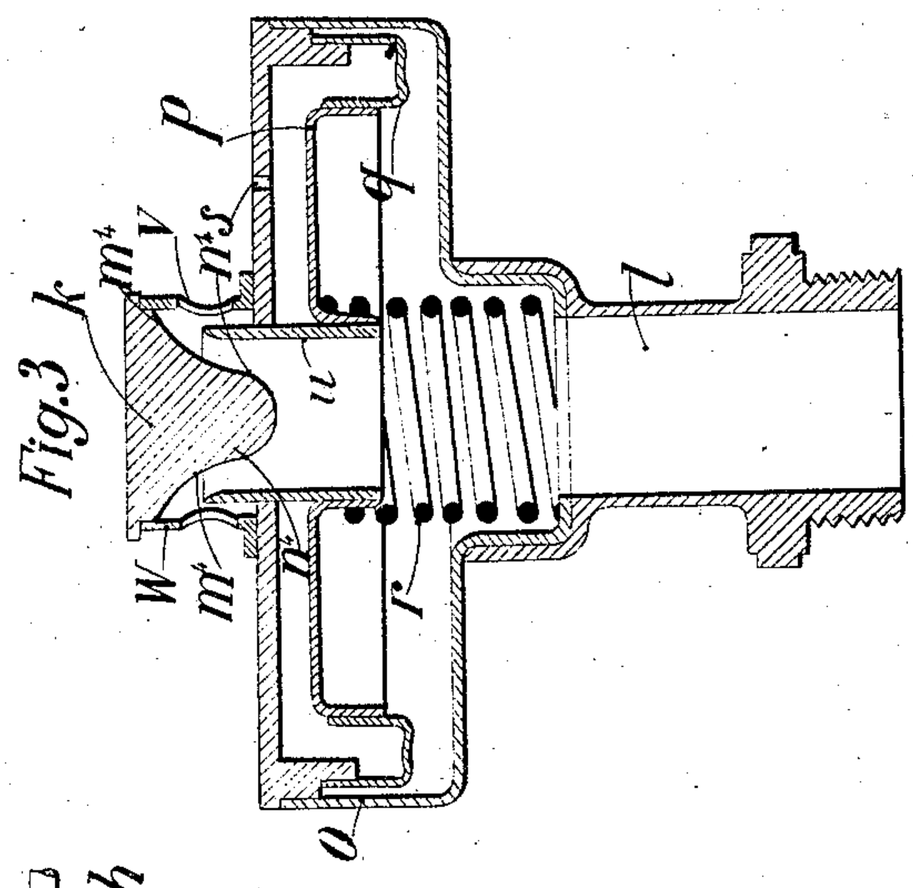

Fig. 3.

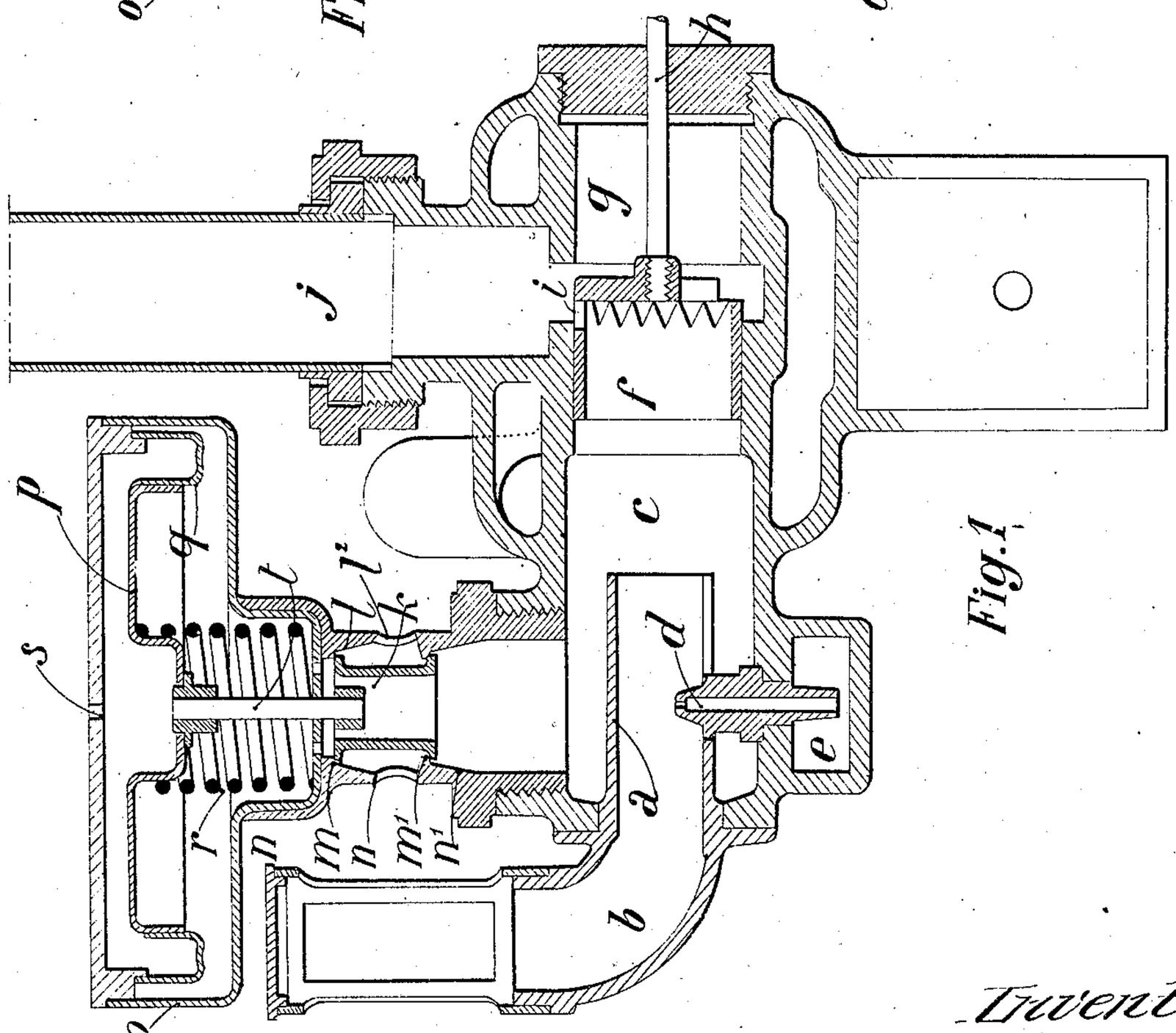

Fig. 1.

Witnesses:
James L. Norris, Jr.
C. D. Kesler

Inventor
Arthur Krebs
by James L. Norris.

No. 785,558. Patented March 21, 1905.

UNITED STATES PATENT OFFICE.

ARTHUR KREBS, OF PARIS, FRANCE, ASSIGNOR TO SOCIÉTÉ ANONYME DES ANCIENS ETABLISSEMENTS PANHARD ET LEVASSOR, OF PARIS, FRANCE.

OIL-ENGINE.

SPECIFICATION forming part of Letters Patent No. 785,558, dated March 21, 1905.

Application filed September 26, 1903. Serial No. 174,827.

To all whom it may concern:

Be it known that I, ARTHUR KREBS, engineer, a citizen of the French Republic, residing at 19 Avenue d'Tory, Paris, Department of Seine, France, have invented certain new and useful Improvements in Oil-Engines, of which the following is a specification.

This invention relates to oil-engines; and it consists in improvements in a fuel-governor for oil-engines forming the subject-matter of United States Letters Patent No. 734,421, patented July 21, 1903. In the automatic carbureter described in the aforesaid specification the additional air-inlet is obtained by the movement of a cylindrical piston over suitable air-inlets in the walls of the cylinder in which such piston moves. This piston is connected to a regulating-head and moves therewith under the influence of the depression or partial vacuum caused by the working of the engine in such a manner as to increase the admission of air in proportion to any increase of vacuum or depression which may be caused, thus maintaining the proportions of the explosive mixture constant. In my improved carbureter I retain the principal features of the carbureter described and claimed in the aforesaid specification; but I improve the means of obtaining the additional air-supply in the following respects.

In the accompanying drawings, Figures 1, 2, and 3 are views in vertical section, illustrating three forms of my invention.

Similar letters of reference indicate corresponding parts in the several figures.

a indicates the main air-inlet, consisting of a pipe communicating at one end with the atmosphere through an elbow *b*.

c is the atomizing-chamber.

d is the injecting-nozzle, the lower end of which communicates with a chamber *e* connected to the oil-reservoir. (Not shown in the drawings.)

f represents a hollow slide-valve sliding in a chamber *g* and provided with a stem *h*, which is connected with and actuated by the engine-governor. The said slide-valve is provided with a peripheral port *i*, preferably composed of triangular openings and communicating with the exhaust-pipe *j*, so that the movements of the said valve *f* throttle more or less and gradually the combustible mixture.

As in the aforesaid patent, a hollow piston *k* slides easily in a chamber *l*, communicating with the atomizing-chamber *c*, so as to control the supplemental air-inlet orifices l^2 in the chamber *l*, in which it moves. The said hollow piston *k* is connected by a stem *t* to a regulating-head *p*, moving freely in a large chamber *o*, the joint between the said regulating-head and chamber, the regulating-head and its chamber being made by an elastic and impervious diaphragm *q*, connected with the said regulating-head and chamber. The regulating-head moves in its chamber without friction in consequence of its being connected by the aforesaid diaphragm. A spring *r* normally forces the said regulating-head against the upper end of its chamber. In this position the piston *k* closes the aforesaid supplemental air-inlets l^2. One side of the regulating-head communicates with the atmosphere through a hole *s*, provided in the upper end of the chamber, the said hole being of a small diameter in order to prevent the vibrations of the piston. The other side of the said regulating-head communicates with the atomizing-chamber *c* through the chamber *l*.

When the engine is at work, the slide-valve *f* controls the passage *i* for combustible mixture through the said valve. The suction-stroke of the engine-piston tends to create a vacuum in the atomizing-chamber, and the regulating-head *p*, which communicates on one side with the atomizing-chamber through the hollow piston attached to it, is also acted upon by the suction in the atomizing-chamber. An increase in the suction causes the said regulating-head to further compress its spring *r* and the hollow piston attached thereto to move so as to uncover more or less the supplemental air-inlets l^2. The chamber *l* and the hollow piston *k* are of such contour that an additional quantity of air enters the atom-

izing-chamber *c* and mixes with the mixture issuing from the main inlet-pipe in such a manner as automatically to maintain the proportions of the explosive mixture constant.

According to one form of my invention, Fig. 1, I form the cylindrical valve *k* with flanges at either end and connect it with the aforesaid regulating-head *p* in such a manner that when there is no depression it rests on two bosses *m m'*, which are preferably of equal size. The cylindrical chamber *l*, in which this valve moves, has its walls outwardly inclined at *n n'* in such a manner that when the valve moves from its seating under the influence of the depression an additional passage is formed of such a size as to maintain the constancy of the explosive mixture.

According to a modification of my invention, Fig. 2, I maintain the cylindrical form of the chamber *l* as to shape, the outer surface of the valve being inclined at m^2 m^3 for securing the advantageous result hereinbefore set forth. Said chamber is provided with stops n^2 n^3 to limit the upward movement of the said valve. According to a further modification of my invention, Fig. 3, I obtain the same result by passing a cylindrical valve *u* through the regulating-head *p* and through the top of the chamber *l*, in which it is contained. I then provide on the top of the said chamber an additional cylinder *w*, containing air-inlets, and provide same with a conical plug *k*, having tapered or inclined portions m^4 n^4, so that when the regulating-head *p* is moved by the suction-stroke of the engine the cylindrical valve is moved therewith away from the plug and increases the additional air-inlet to such an extent as to give the necessary increased supply of air to maintain the proportions of the explosive mixture constant.

Having now particularly described and ascertained the nature of my invention and in what manner the same is to be performed, I declare that what I claim is—

1. In a vaporizer for oil-engines, the combination of a main air-supply, fuel-injecting means coactive therewith, an atomizing-chamber, an exhaust-conduit, a second chamber provided with air-inlets and having an inclined inner wall, and a suction-operated valve situated in said second chamber, said valve, when opened, being out of contact with said inclined wall to thereby provide a space between the valve and second chamber.

2. In a vaporizer for oil-engines, the combination of a main air-supply, fuel-injecting means coactive therewith, an atomizing-chamber, an exhaust-conduit, a second chamber provided with air-inlets and having an inclined inner wall, and a suction-operated valve situated in said second chamber, said valve, when opened, being out of contact with said inclined wall to thereby provide a space between the valve and second chamber, and means for limiting the upward movement of the valve.

3. In a vaporizer for oil-engines, the combination of a main air-supply, fuel-injecting means coactive therewith, an atomizing-chamber, an exhaust-conduit, a second chamber provided with air-inlets and having an inclined inner wall, and a suction-operated valve situated in said second chamber, said valve, when opened, being out of contact with said inclined wall to thereby provide a space between the valve and second chamber, and bosses in the second chamber for limiting the upward movement of the valve.

In testimony whereof I have hereunto set my hand in presence of two subscribing witnesses.

ARTHUR KREBS.

Witnesses:
PAUL F. PÂQUET,
R. LEIP.