

No. 732,830.

PATENTED JULY 7, 1903.

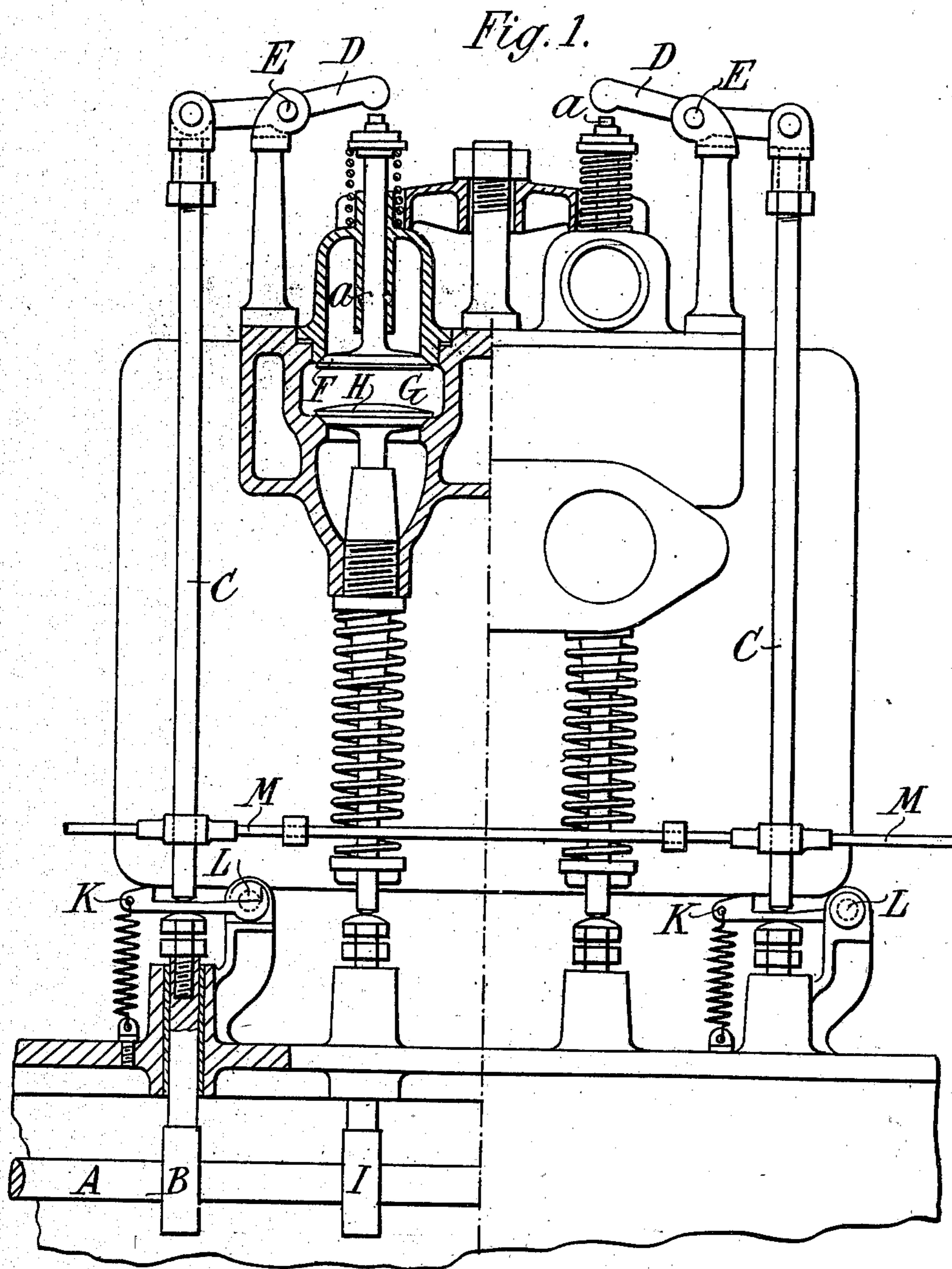
A. CLÉMENT.

REGULATOR FOR SUCTION VALVES OF EXPLOSIVE ENGINES.

APPLICATION FILED OCT. 9, 1902.

NO MODEL.

2 SHEETS—SHEET 1.



WITNESSES:

Ired White  
Rene' Prouine

INVENTOR:

Adolphe Clément,

By his Attorneys:

Arthur C. Orser

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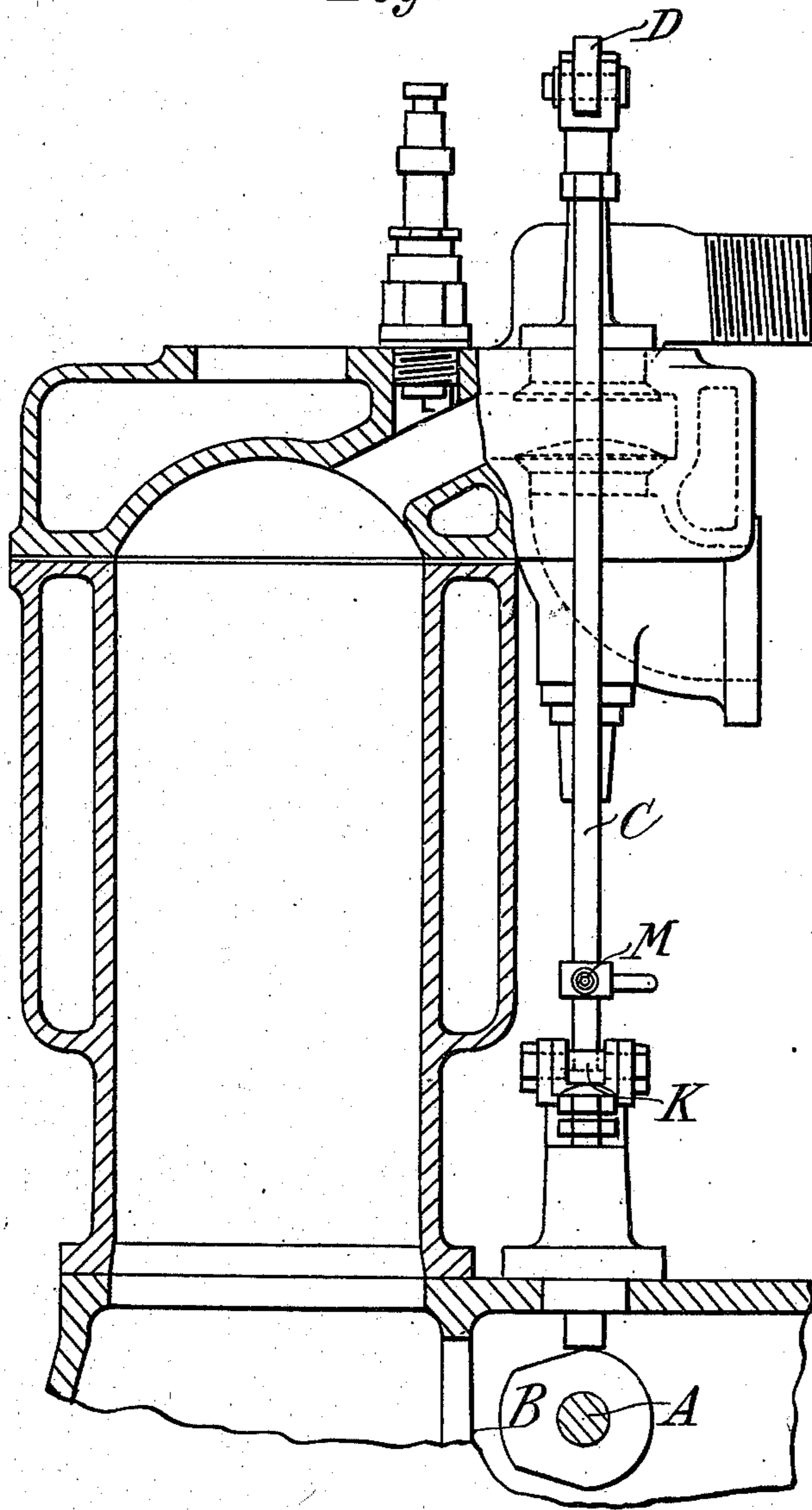
REGULATOR FOR SUCTION VALVES OF EXPLOSIVE ENGINES.

APPLICATION FILED OCT. 9, 1902.

NO MODEL.

2 SHEETS—SHEET 2.

*Fig. 2.*



WITNESSES:

*Ired White*  
*Rene Perrine*

INVENTOR:

*Adolphe Clément,*  
*By his Attorneys:*  
*Arthur C. Orson*

# UNITED STATES PATENT OFFICE.

ADOLPHE CLÉMENT, OF LEVALLOIS-PERRET, FRANCE.

## REGULATOR FOR SUCTION-VALVES OF EXPLOSIVE-ENGINES.

SPECIFICATION forming part of Letters Patent No. 732,830, dated July 7, 1903.

Application filed October 9, 1902. Serial No. 126,382. (No model.)

*To all whom it may concern:*

Be it known that I, ADOLPHE CLÉMENT, a citizen of the Republic of France, residing in Levallois-Perret, Seine, France, have invented certain new and useful Improvements in Regulators for Suction-Valves of Explosive-Engines, of which the following is a specification.

In all petrol-motors the suction-valves open automatically every second revolution owing to the vacuum produced within the cylinder during the descent of the piston. This arrangement is advantageous because of its simplicity; but it presents the defect that the counter-springs must necessarily be very weak, so that sometimes the valves do not open when they are stuck by carbonized oil or the like, or they do not close at the proper moment, thus permitting the hot gases to be forced into the carbureter. In some motors the suction-valves are controlled mechanically in the same manner as the exhaust-valves, thus permitting of the employment of much more powerful springs and of a suitable cam and also of exactly regulating the moment of opening and closing the valve. In this case the suction-valves are placed either side by side with the exhaust-valves or upon the other side of the cylinder, thus necessitating the use of another cam-shaft. These two arrangements, which are the only ones which have hitherto been employed, present the defect of considerably increasing the volume of the conduit upon the compression-chamber or of creating a fresh one upon the other side of the cylinder. In either case the volume of the compression-chamber situated directly above the piston is decreased by this amount, and the utilization of the explosive force of the mixture is consequently reduced, this explosion taking place to a great extent in the lateral conduit or conduits. Obviously, therefore, it is of importance to diminish the size of these conduits as much as possible. In accordance with my invention this result is attained by retaining the automatically-operated suction-valve in the position which it occupies in motors in which it is automatic—that is to say, directly above the exhaust-valve.

The improved arrangement is illustrated

in the accompanying drawings in Figures 1 and 2.

The shaft A for the exhaust-cams rotates at half the velocity of the driving-shaft and also carries the suction cam or cams B, according as the motor has one or more cylinders. This cam B by the intermediary of mechanism hereinafter described presses upon the extremity of a rod C, fixed upon a double lever D, pivoted at E, while the other extremity bears upon the rod *a* of the suction-valve F. By means of this arrangement the conduit G is no larger than it would be if it only served to conduct the burned gases to the exhaust-valve H. In addition to this only one shaft is employed for the suction-cams B and the exhaust-cams I. With this arrangement I have combined a mechanism permitting, either by hand or governor adjustment or by both in combination, of imparting variable lifts to the suction-valve from zero up to the maximum rise provided for. In order to effect this, the cam B presses by the intermediary of appropriate parts beneath a lever K, pivoted at L, and of which the radius of curvature is equal to the length of the rod C. A rod M, operated either by hand or automatically by the governor or by both means in combination, is capable of displacing the point of support of the rod or rods C upon the lever K. According as this point of support is above or in more or less close proximity to the point L the suction-valve will not rise or will rise to a greater or less extent. In this manner a regulation of the speed and power of the motor is obtained in an extremely simple manner, because within a certain limit the varying lifts of the suction-valve correspond to the different powers of the motor and no explosion will be produced when the rod C is at the point L, because the suction-spring is sufficiently strong to prevent the suction-valve from opening automatically.

I claim as my invention—

1. In a petroleum-motor, the combination of a suction-valve, a cam for operating the same, a substantially horizontal lever L arranged to receive motion from said cam, a vertical rod C resting at its lower end on said lever L, a lever D bearing against the stem of said valve and pivotally connected to the

upper end of said rod C, and means for moving the lower end of said rod over said lever L so that it rests on said lever at different distances from the pivotal point and thus  
5 varies the lift of the rod and the opening of the valve.

2. In a petroleum-motor, the combination with a suction-valve of a cam for operating the same, a substantially horizontal lever L  
10 arranged to receive motion from said cam, a substantially vertical rod C resting at its lower end on said lever L, a lever D bearing on the stem of said valve and pivoted to the upper end of said rod C, means for moving  
15 the lower end of said rod on said lever to

rest at different distances from the pivotal point of the lever so as to vary the lift of the rod and the opening of the valve, said lever L having a bearing-face for the lower end of said rod extending from the pivotal point of  
20 the lever outward so as to permit a variation in the opening of the valve from zero to any desired extent.

In witness whereof I have hereunto signed my name in the presence of two subscribing  
25 witnesses.

ADOLPHE CLÉMENT.

Witnesses:

EDWARD P. MACLEAN,  
GABRIEL BELLARD.