(No Model.) 2 Sheets—Sheet 1.

F. W. LANCHESTER.

GAS ENGINE GOVERNOR.

No. 445,021. Patented Jan. 20, 1891.

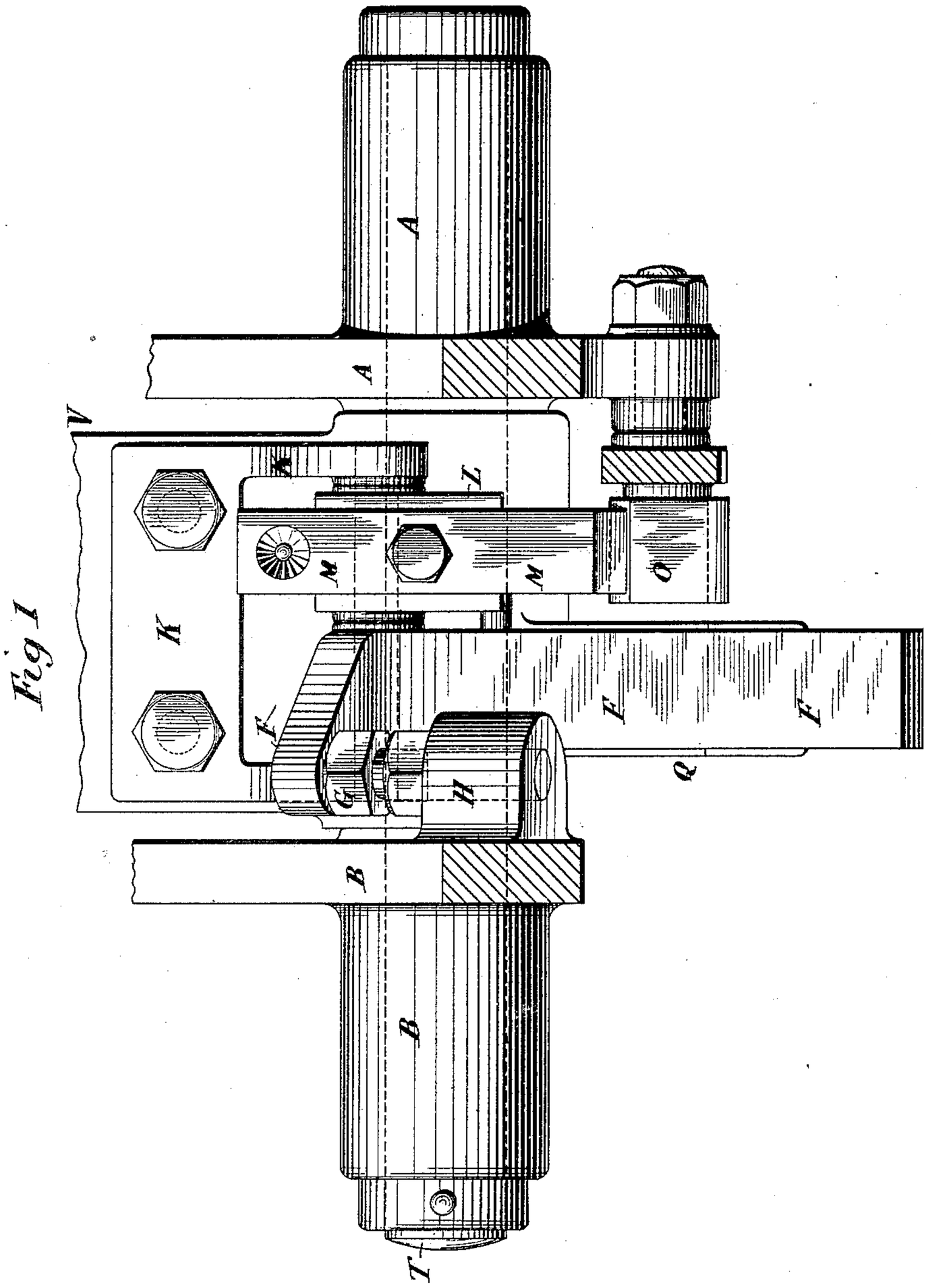

Fig 1

Witnesses:
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Inventor:
F. W. Lanchester.
by Herbert W. Jenner.
Attorney.

(No Model.) 2 Sheets—Sheet 2.

F. W. LANCHESTER.

GAS ENGINE GOVERNOR.

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Fig 3

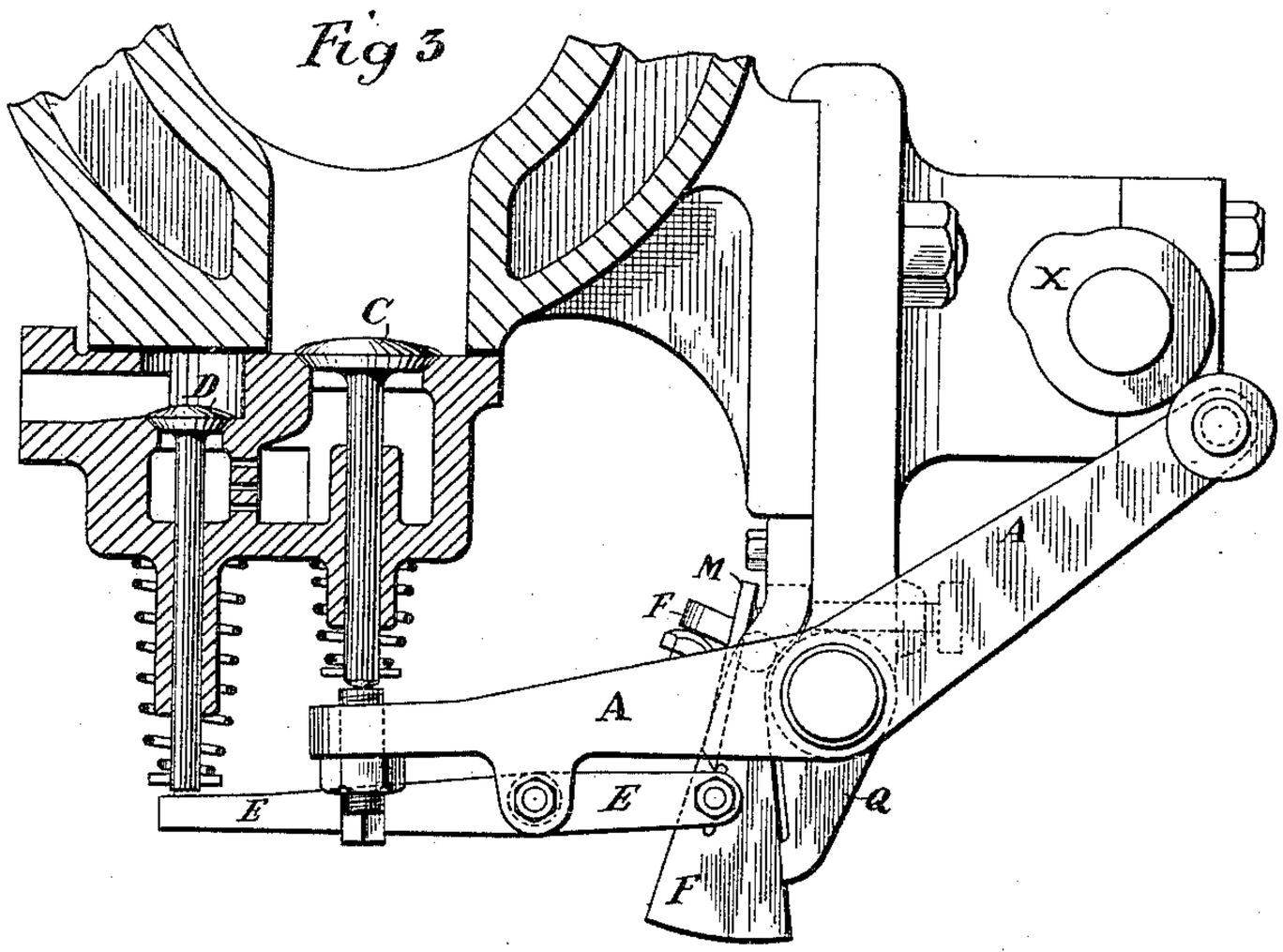
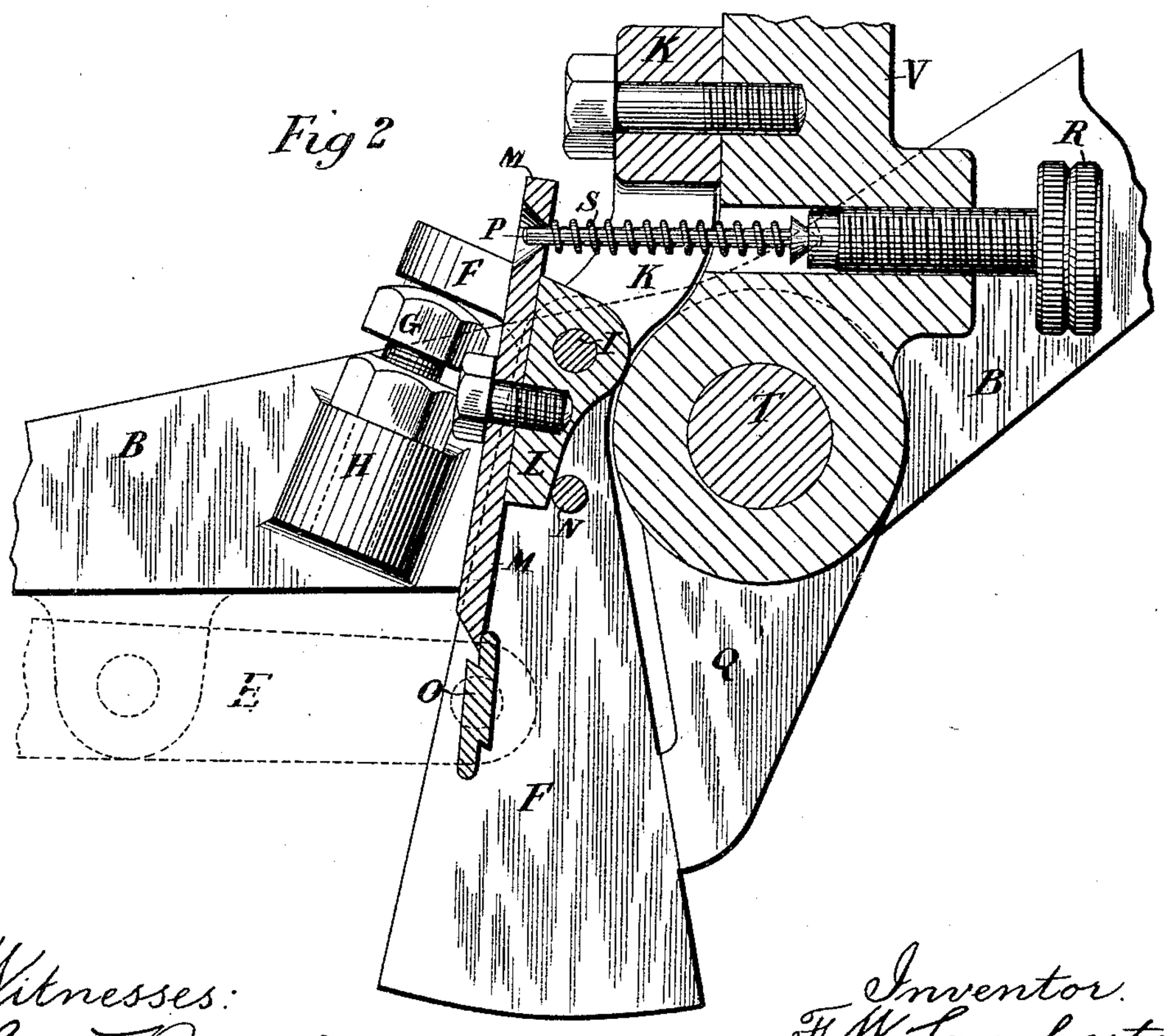


Fig 2



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UNITED STATES PATENT OFFICE.

FREDERICK WILLIAM LANCHESTER, OF LONDON, ENGLAND.

GAS-ENGINE GOVERNOR.

SPECIFICATION forming part of Letters Patent No. 445,021, dated January 20, 1891.

Application filed June 20, 1890. Serial No. 356,048. (No model.)

To all whom it may concern:

Be it known that I, FREDERICK WILLIAM LANCHESTER, a subject of the Queen of Great Britain and Ireland, residing at Bedford Row, in the county of Middlesex, England, have invented certain new and useful Improvements in Gas-Engine Governors; 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 for improvements in apparatus for governing gas and other motive-power engines relates to regulating or controlling the speed of engines in which the motive power is derived from an inflammable gas or vapor, which is admitted together with a suitable proportion of atmospheric air into the working-cylinder, and there burned or exploded, thus increasing its pressure to actuate the piston of the engine during the working-stroke, after which it is exhausted, and has for its object to more effectually regulate or control the speed of the engine.

This invention consists in providing a ready means whereby the supply of inflammable gas or vapor is completely cut off from the working-cylinder when the speed of the engine exceeds a predetermined amount.

In a governor constructed according to this invention a gas-governing lever pivoted to an admission-lever operated by a cam driven by the engine and acting directly on the stem of the air-admission valve has one end bearing against the stem of the gas-admission valve, and its other end carries on one side a catch-plate which normally, when the air-admission lever is actuated by its cam, bears against the end of the steel blade actuated by a weighted lever or pendulum pivoted to a fixed support and raised by an arm projecting from an exhaust-lever operated by a second cam also driven by the engine and actuating the exhaust-valve, so that slightly before the air-admission lever is operated the pendulum previously raised by the exhaust-lever is released, and, if the speed be not above the predetermined amount, returns to its normal position in time for the steel blade to engage with the catch-plate and form a fixed fulcrum for the governing-lever, which then opens the gas-valve at the same time that the air-valve is opened by its lever; but if the speed of the engine be above the predetermined amount the said steel blade does not return in time to gear with the catch-plate, when the governing-lever, instead of opening the gas-valve, fulcrums on it. The gas and air valves are both closed by springs.

In the accompanying two sheets of illustrative drawings, Figure 1 is a front sectional elevation of a governor constructed according to this invention. Fig. 2 is a side sectional elevation of the same, and Fig. 3 is a side sectional elevation of the same to a reduced scale, showing the connections to the cam-shaft and admission-valves.

The admission-lever A and exhaust-lever B are arranged side by side and pivoted on the same axis T, fixed in a suitable support V, and are operated by separate cams driven by the engine. The admission-lever A actuates the air-admission valve C directly, and to it is pivoted the gas-governing lever E, one end of which bears against the stem of the gas-valve D, the other end carrying the catch-plate O. A pendulum F is pivoted loosely on the axis I, carried by a bracket K, bolted to the fixed support V. A small carrier L, also pivoted loosely on the axis I, carries a steel blade M, and is forced against a stop N on the pendulum F by the spiral spring S, supported on a guide-rod P, having one end centered in the adjusting-screw R and its other end passing loosely through a hole in the blade M. The spring S bears against the blade M and adjusting-screw R, which is mounted in the fixed support V. The pendulum F is raised by the adjustable tappet-screw G, mounted in the projection H from the exhaust-lever B. The projection Q from the support V forms a buttress for the pendulum to rest against instead of hammering the screw G.

A stop may be provided to limit the displacement of the pendulum. The pendulum F, being raised by the exhaust-lever B, as before described, carries with it the steel blade M and is released on the return of the exhaust-lever slightly before the admission-lever A is operated by its cam. If the speed of the engine be above its predetermined amount, the pendulum F and blade M will not return in time for the blade M to gear with the catch-plate O before the admission-lever A is oper-

ated by its cam, and the governing-lever E consequently will not open the gas-valve D, but will bear on its stem as a fixed support, the end carrying the catch-plate O being free to move. If the speed of the engine be at or below its normal rate, the pendulum F and blade M will return before the admission-lever A is operated by its cam, and the blade M will engage with the catch-plate O and consequently form a fulcrum for the governing-lever E, which will then open the gas-valve D at the same time that the air-valve C is opened. The spring S serves to regulate the speed at which the blade M will just miss the catch-plate O. The objects of having the steel blade M and pendulum F separate are to throw the momentum of the weight F onto the buttress Q instead of it being taken up by the catch-plate O, and also to allow a certain free motion of the weight in order that any rebound that takes place shall not affect the blade.

What I claim as my invention, and desire to secure by Letters Patent, is—

1. In a speed-governor, the combination, with a pivoted lever A, for opening the air-valve, of a lever E, for opening the gas-valve, pivoted to the said lever A and provided with a catch-plate, a gravity-actuated blade pivoted to a stationary support and adapted to engage with the said catch-plate to effect the opening of the gas-valve, and a pivoted exhaust-valve lever B, provided with a tappet for lifting the said blade clear of the catch-plate, substantially as and for the purpose set forth.

2. In a speed-governor, the combination, with a pivoted air-valve lever A, of a gas-valve lever E, pivoted to the said lever A and provided with a catch-plate, a weight pivoted to a stationary support, a pivoted exhaust-valve lever B, provided with a tappet for raising the said weight, and a pivoted blade for engaging with the said catch-plate, adapted to fall with the said weight and to be raised by a projection on the weight, substantially as and for the purpose set forth.

3. In a speed-governor, the combination, with a pivoted air-valve lever A, of a gas-valve lever E, pivoted to the said lever A and provided with a catch-plate, a gravity-actuated blade pivoted to a stationary support and adapted to engage with the said catch-plate to effect the opening of the gas-valve, an adjustable spring for regulating the speed of the fall of the said blade, and a pivoted exhaust-valve lever B, provided with a tappet for lifting the said blade clear of the catch-plate, substantially as and for the purpose set forth.

In witness whereof I have hereunto set my hand in the presence of two witnesses.

FREDERICK WILLIAM LANCHESTER.

Witnesses:

FREDERICK BAXTER,

JNO. BEAUMONT,

53 *New Street, Birmingham, Clerks to W. H. Harris, Notary Public.*