

(No Model.)

C. GRAMM.

VALVE OPERATING GEAR FOR GAS, PETROLEUM, OR OTHER
SIMILAR ENGINES.

No. 453,080.

Patented May 26, 1891.

Fig. 1.

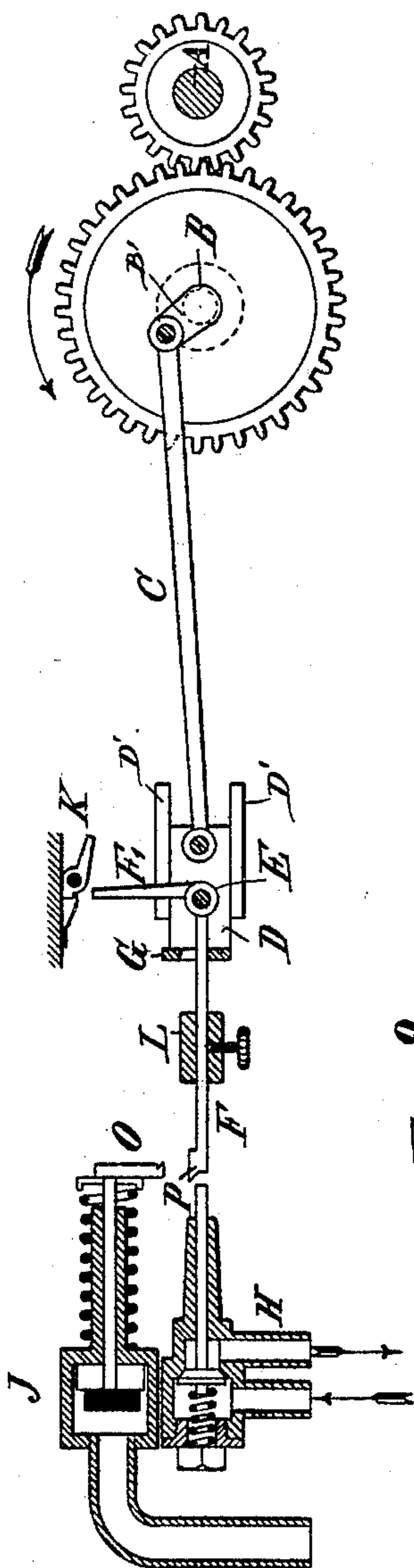


Fig. 3.

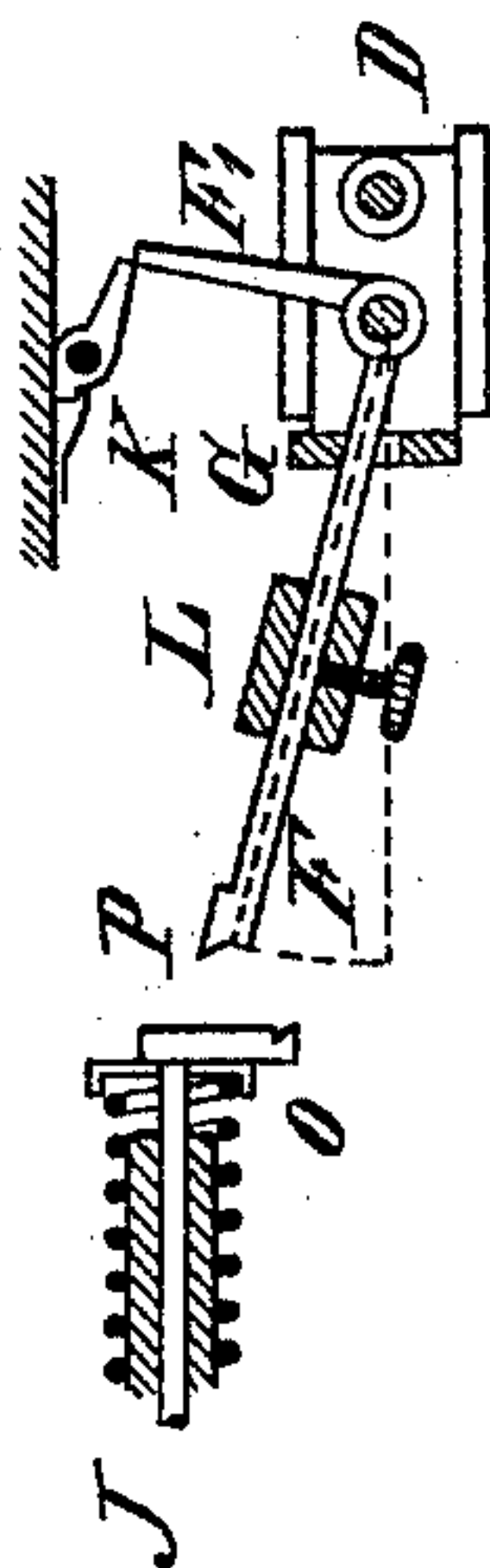
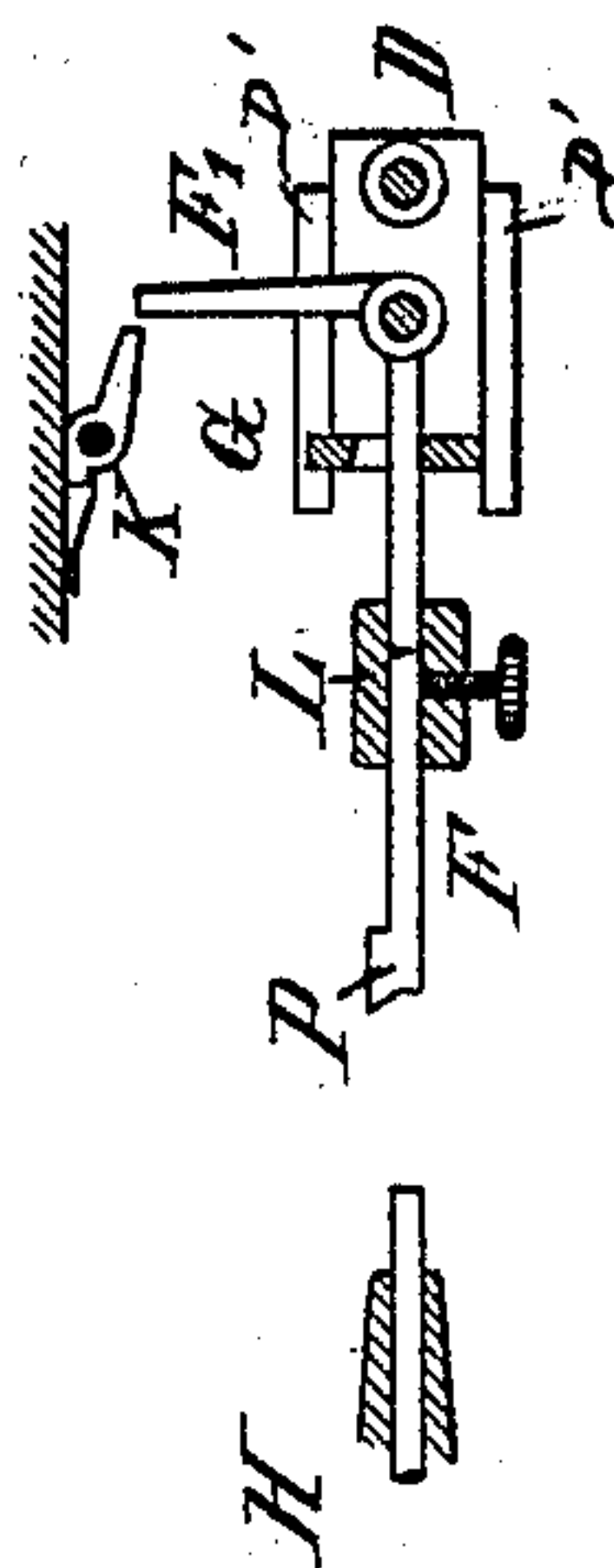


Fig. 2.



Witnesses:

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UNITED STATES PATENT OFFICE.

CARL GRAMM, OF BERLIN, GERMANY, ASSIGNOR TO THE BERLINER MASCHINENBAU ACTIEN-GESELLSCHAFT, VORMALS L. SCHWARTZ-KOPFF, OF SAME PLACE.

VALVE-OPERATING GEAR FOR GAS, PETROLEUM, OR OTHER SIMILAR ENGINES.

SPECIFICATION forming part of Letters Patent No. 453,080, dated May 26, 1891.

Application filed February 10, 1891. Serial No. 380,880. (No model.)

To all whom it may concern:

Be it known that I, CARL GRAMM, a subject of the King of Prussia, residing at Berlin, in the Kingdom of Prussia, German Empire, have invented new and useful Improvements in or Relating to the Valve-Operating Gear for Gas, Petroleum, or other Similar Engines, of which the following is a specification.

This invention relates to gas, petroleum, or other similar engines; and its object is to provide an operating-gear therefor, whereby two adjacent closing devices—such as distributing or slide valves—may be alternately operated, so that when one of the said devices is opened the other will be closed, and vice versa.

The invention consists in the construction, arrangement, and combination of parts, as hereinafter described and claimed.

Reference is to be had to the accompanying drawings, forming a part of this specification, in which similar letters of reference designate corresponding parts in all the views.

Figure 1 is a sectional side elevation of a portion of a gas, petroleum, or other similar engine having the invention applied; and Figs. 2 and 3 are detail side elevations of the same, partly in section, and hereinafter more particularly described.

Referring to the drawings, A is the main driving-shaft of the engine, provided with a gear which meshes with a gear of twice its size mounted on the way-shaft B, which shaft is provided with a crank or eccentric B', pivotally connected by a link C with a block D, adapted to reciprocate in guideways D' on the frame of the engine.

The block D is provided with a pin E, upon which is pivoted at its angle a bell-crank lever F F', the long arm F of which lever passes through an opening in a guide G on the end of the block D next the pivot of the lever, the opening in said guide having a straight lower edge and an upwardly and outwardly inclined upper edge. The office of said guide is to limit the upward and downward movement of the lever-arm F, as hereinafter explained. The arm F' of the bell-crank lever carries an adjustable weight L, adapted to be held at any desired location on said arm by a set-

screw, as shown, or by any other proper means, and at the outer end of said arm is formed a projection P, having a knife-edge.

In alignment with the long arm of the bell-crank lever is located a valve H, which when opened or closed admits or cuts off the flow of gas, petroleum, or other combustible from the usual reservoir, and above the valve H is arranged a cut-off slide or valve J, serving to admit or cut off the supply of air, the stem of said valve being provided on its outer end with a head O, which is notched at its lower end. To the frame of the engine above the block D is pivoted an adjustable catch or strip K, which is pressed upon at the front of its pivot by a spring.

Fig. 2 of the drawings shows the position of the operating mechanism at the moment when the sliding block has reached the end of its course to the right. When said block and the bell-crank lever are moved to the left by the action of the way-shaft crank B' through the link C, the arm F' of the bell-crank lever contacts with the catch K, whereupon said lever is caused to turn upon its pivot, so that its weighted arm F assumes the position shown in Fig. 3, its upward movement being limited by the guide G. As the slide is moved still farther to the left the arm F' of the bell-crank lever is disengaged from the catch K, and the weight on the arm F of the lever causes the arm to descend, and as the arm reaches the base of the opening in the guide its projection P strikes the stem of the valve H, (see Fig. 1,) causing the valve to open and admit the required amount of gas, petroleum, or other combustible. As the slide D returns to the right again the lever-arm F raises the catch K, which is immediately pressed down by its spring, and the parts assume the position shown in Fig. 2, ready for operation, as before.

The operation just described is that under normal circumstances. Should it happen from any cause that the proper number of revolutions of the way-shaft is exceeded, the lever-arm F would not have time to move past the head O of the valve J, (see Fig. 3,) but would engage by its projection P the notch in said head, thereby closing said valve and render-

ing it impossible for a charge of the combustible to be drawn in, thus precluding explosion.

It will be understood that the angle of movement of the bell-crank lever is limited by the guide G independently of the speed of the motor, while the time in which said lever can resume its normal position depends solely upon the position of the weight L or that of the catch K. By properly adjusting the weight on the lever-arm F' and arranging the catch K relatively to the lever-arm F' the precise moment of engagement of the projection P with the head O may be determined and the speed of the motor regulated.

Having thus described my invention, what I claim as new, and desire to secure by Letters Patent, is--

1. A valve-operating gear for gas, petroleum, or other similar engines, consisting of a horizontally-reciprocable block, a gravitating vertically-rocking bell-crank lever on said block, a yielding trip or catch for said lever, and a connection between the reciprocable block and the way-shaft of the engine, substantially as shown and described.

2. A valve-operating gear for gas, petroleum, or other similar engines, consisting of

a block horizontally reciprocable on the engine-frame, a bell-crank lever pivoted for limited rocking movement on the block, having a weighted horizontal arm adapted to operate the valves in its downward movement, a yielding catch or trip in the path of the vertical arm of the lever, and a connection between the reciprocable block and the reversing-shaft of the engine, substantially as shown and described.

3. In a gas, petroleum, or other similar engine, the combination, with a block horizontally reciprocable on the engine-frame, a bell-crank lever pivoted for limited rocking movement on said block, and a link connecting said block with the way-shaft of the engine, of a movable weight on the horizontal arm of said lever, and an adjustable trip or catch in the path of the vertical arm of the lever, substantially as shown and described, for the purposes set forth.

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

CARL GRAMM.

Witnesses:

LUDWIG GLASER,
GUSTAV HÜLSMANN.