

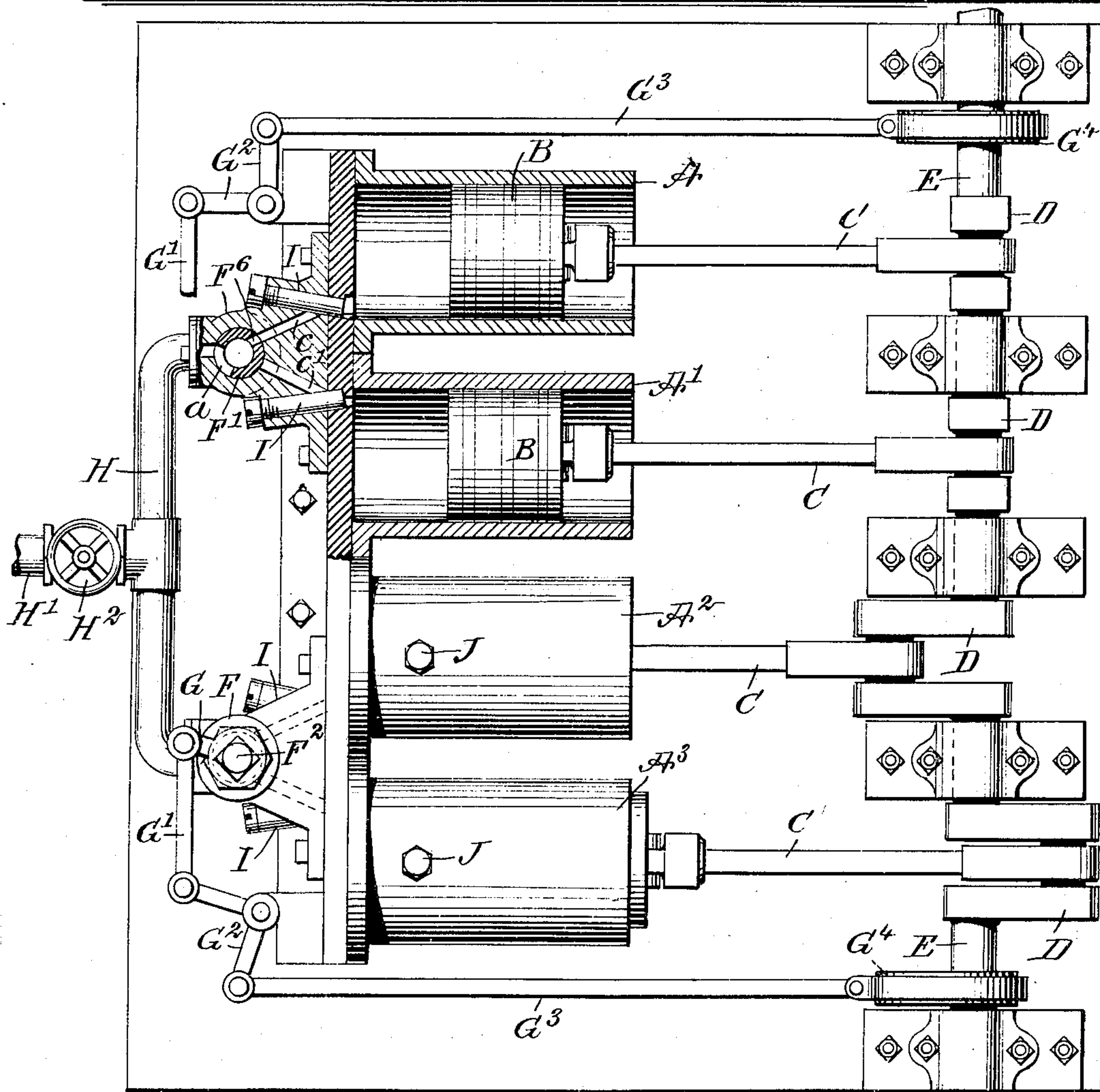
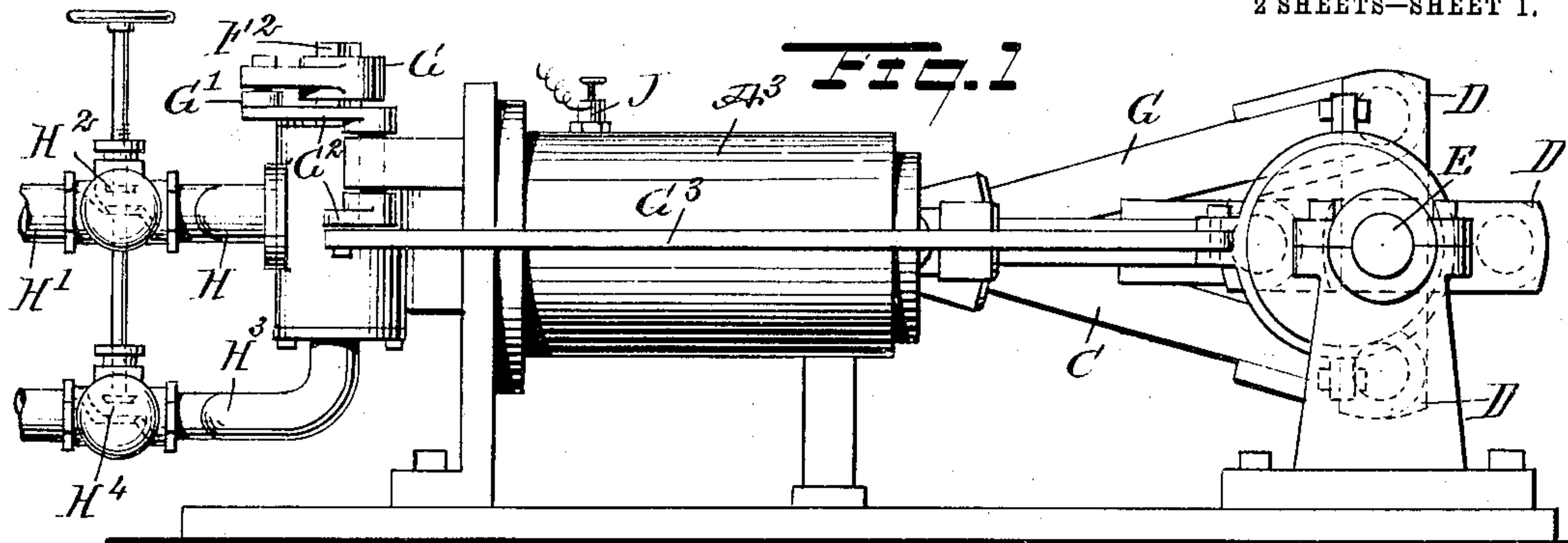
G. KELLER.
MOTOR.

APPLICATION FILED DEC. 2, 1905. RENEWED MAY 19, 1909.

944,441.

Patented Dec. 28, 1909.

2 SHEETS—SHEET 1.



WITNESSES:

John Burroughs
Rev. G. Hervey

INVENTOR

Gottlieb Keller

BY

Wm. M. Munn

ATTORNEYS

FIG. 2

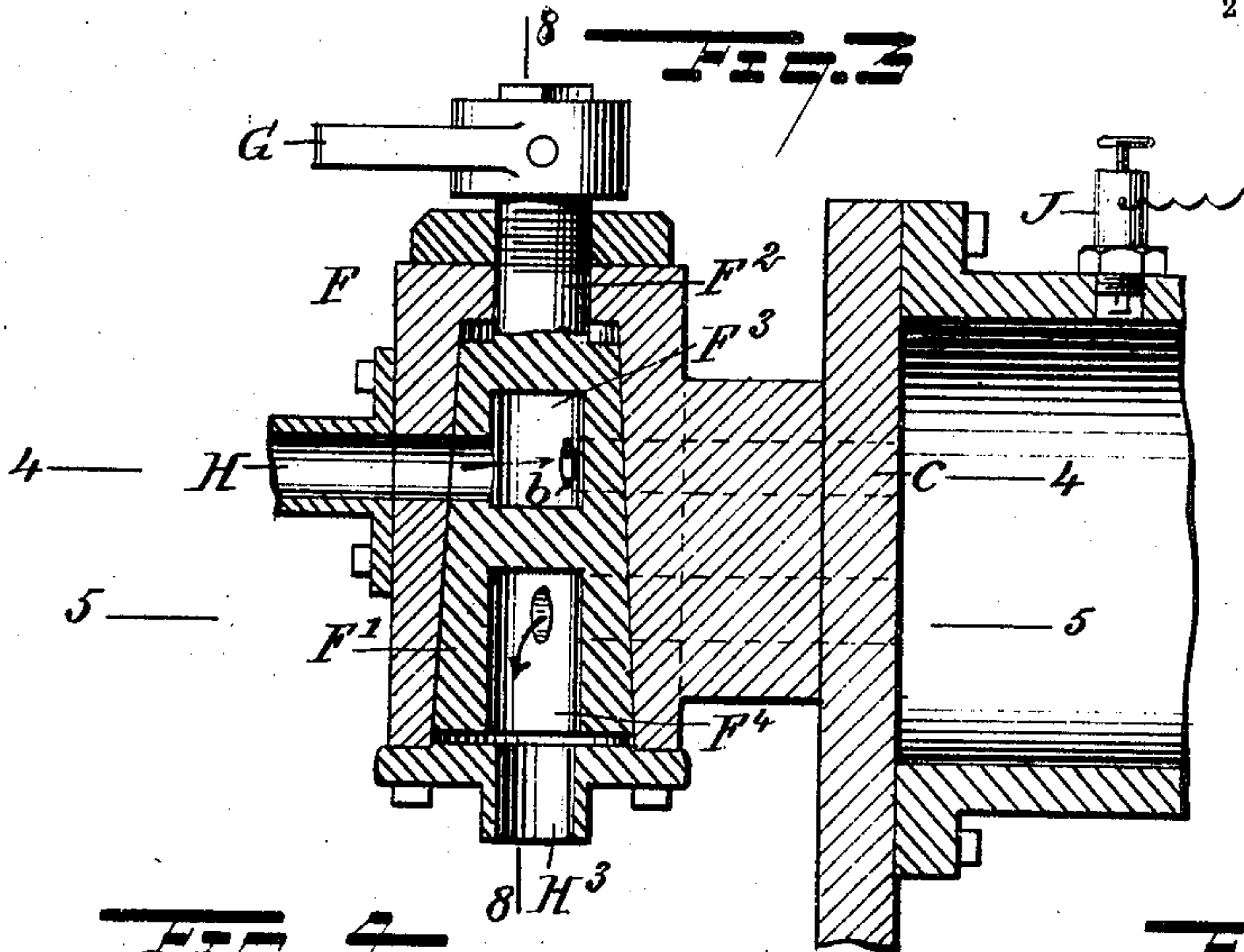
MOTOR.

APPLICATION FILED DEC. 2, 1905. RENEWED MAY 19, 1909.

944,441.

Patented Dec. 28, 1909.

2 SHEETS—SHEET 2.



```

graph TD
    P[President] --> VP[VP]
    P --> COO[COO]
    P --> CFO[CFO]
    P --> CTO[CTO]
    P --> CM[CM]
    P --> CSO[CSO]
    P --> SVP[SVP]
    P --> SVP2[SVP]
    P --> SVP3[SVP]
    P --> SVP4[SVP]
    P --> SVP5[SVP]
    P --> SVP6[SVP]
    P --> SVP7[SVP]
    P --> SVP8[SVP]
    P --> SVP9[SVP]
    P --> SVP10[SVP]
    P --> SVP11[SVP]
    P --> SVP12[SVP]
    P --> SVP13[SVP]
    P --> SVP14[SVP]
    P --> SVP15[SVP]
    P --> SVP16[SVP]
    P --> SVP17[SVP]
    P --> SVP18[SVP]
    P --> SVP19[SVP]
    P --> SVP20[SVP]
    P --> SVP21[SVP]
    P --> SVP22[SVP]
    P --> SVP23[SVP]
    P --> SVP24[SVP]
    P --> SVP25[SVP]
    P --> SVP26[SVP]
    P --> SVP27[SVP]
    P --> SVP28[SVP]
    P --> SVP29[SVP]
    P --> SVP30[SVP]
    P --> SVP31[SVP]
    P --> SVP32[SVP]
    P --> SVP33[SVP]
    P --> SVP34[SVP]
    P --> SVP35[SVP]
    P --> SVP36[SVP]
    P --> SVP37[SVP]
    P --> SVP38[SVP]
    P --> SVP39[SVP]
    P --> SVP40[SVP]
    P --> SVP41[SVP]
    P --> SVP42[SVP]
    P --> SVP43[SVP]
    P --> SVP44[SVP]
    P --> SVP45[SVP]
    P --> SVP46[SVP]
    P --> SVP47[SVP]
    P --> SVP48[SVP]
    P --> SVP49[SVP]
    P --> SVP50[SVP]
    P --> SVP51[SVP]
    P --> SVP52[SVP]
    P --> SVP53[SVP]
    P --> SVP54[SVP]
    P --> SVP55[SVP]
    P --> SVP56[SVP]
    P --> SVP57[SVP]
    P --> SVP58[SVP]
    P --> SVP59[SVP]
    P --> SVP60[SVP]
    P --> SVP61[SVP]
    P --> SVP62[SVP]
    P --> SVP63[SVP]
    P --> SVP64[SVP]
    P --> SVP65[SVP]
    P --> SVP66[SVP]
    P --> SVP67[SVP]
    P --> SVP68[SVP]
    P --> SVP69[SVP]
    P --> SVP70[SVP]
    P --> SVP71[SVP]
    P --> SVP72[SVP]
    P --> SVP73[SVP]
    P --> SVP74[SVP]
    P --> SVP75[SVP]
    P --> SVP76[SVP]
    P --> SVP77[SVP]
    P --> SVP78[SVP]
    P --> SVP79[SVP]
    P --> SVP80[SVP]
    P --> SVP81[SVP]
    P --> SVP82[SVP]
    P --> SVP83[SVP]
    P --> SVP84[SVP]
    P --> SVP85[SVP]
    P --> SVP86[SVP]
    P --> SVP87[SVP]
    P --> SVP88[SVP]
    P --> SVP89[SVP]
    P --> SVP90[SVP]
    P --> SVP91[SVP]
    P --> SVP92[SVP]
    P --> SVP93[SVP]
    P --> SVP94[SVP]
    P --> SVP95[SVP]
    P --> SVP96[SVP]
    P --> SVP97[SVP]
    P --> SVP98[SVP]
    P --> SVP99[SVP]
    P --> SVP100[SVP]
    
```

THE

[illegible]

52

WITNESSES:

Johna Burghstone
Rev. J. H. H. H.

INVENTOR

Gottlieb Keller

BY

Mumukshu

ATTORNEYS

UNITED STATES PATENT OFFICE.

GOTTLIEB KELLER, OF NEW YORK, N. Y.

MOTOR.

944,441.

Specification of Letters Patent. Patented Dec. 28, 1909.

Application filed December 2, 1905, Serial No. 289,969. Renewed May 19, 1909. Serial No. 496,936.

To all whom it may concern:

Be it known that I, GOTTLIEB KELLER, a citizen of the Republic of Switzerland, and a resident of the city of New York, borough of Manhattan, in the county and State of New York, have invented a new and Improved Motor, of which the following is a full, clear, and exact description.

The object of the invention is to provide a new and improved motor or explosion engine of the two-cycle type arranged to utilize the motive agent to the fullest advantage by giving continuous impulses in proper rotation to a plurality of pistons connected with the main shaft, to insure a steady and uniform running of the engine and hence permit the use of the motor on automobiles and the like.

The invention consists of novel features and parts and combinations of the same which will be more fully described hereinafter and then pointed out in the claim.

A practical embodiment of the invention is represented in the accompanying drawings forming a part of this specification, in which similar characters of reference indicate corresponding parts in all the views.

Figure 1 is a side elevation of the improvement; Fig. 2 is a plan view of the same, parts being in section; Fig. 3 is an enlarged sectional side elevation of the valve for controlling the admission and exhaust of the motive agent; Fig. 4 is a sectional plan view of the same, on the line 4—4 of Fig. 3; Fig. 5 is a similar view of the same, on the line 5—5 of Fig. 3; Figs. 6 and 7 are similar views, showing the valve plug in a shut-off position; and Fig. 8 is a cross-section of the valve, on the line 8—8 of Fig. 3.

The improved motor as illustrated in the drawings is preferably provided with two pairs of cylinders A, A' and A², A³, and in each of the cylinders is mounted to reciprocate a piston B connected by a pitman C with a crank arm D on the main driving shaft E, the crank arms D for the pistons in the cylinders A and A' being arranged diametrically opposite each other, and the crank arms D for the pistons in the cylinders A² and A³ being likewise arranged diametrically and at right angles to the crank arms D for the pistons of the cylinders A and A'; thus the several crank arms stand in quarter positions relative to each other, as will be readily understood by reference to Fig. 1. The motive agent to and from the

pairs of cylinders A, A' and A², A³ is controlled by valves F, each of which is provided with a rocking conical valve plug F', provided at its stem F² with an arm G connected by a link G' with a bell crank lever G² connected with the eccentric rod G³ of an eccentric G⁴ secured on the main shaft E. Thus, by the arrangement described each valve plug F' is turned in unison with the movement of the pistons B, as the latter are connected with and impart rotary motion to the main shaft E.

Each valve plug F' is provided with two chambers or compartments F³ and F⁴, of which the chamber F³ is the inlet chamber and the chamber F⁴ is the exhaust chamber. The inlet chamber F³ is provided, in its side wall, with a port *a* at all times in register with a supply pipe H connected by a pipe H' with a suitable source of motive agent supply, the valve H' being provided with a suitable valve H² for controlling the flow of the motive agent to the pipe H. Each of the inlet chambers F³ is also provided with an admission port *b* adapted to alternately register with ports *c* and *c'* leading to the outer ends of the cylinders A, A' or A², A³ so as to alternately admit motive agent from the chamber F³ to the corresponding cylinder A or A' and A² or A³. In each of the ports *c* and *c'* is arranged a check valve I to prevent accidental back firing. The exhaust chamber F⁴ in each valve plug F' is provided in its side wall, with two ports *d* and *d'* adapted to register alternately with exhaust ports *e* and *e'* leading from the cylinders A and A' or A² and A³. The bottom of each chamber F⁴ connects with an exhaust pipe H³ for carrying off the exhaust to a suitable place of discharge, the pipe H³ containing a valve H⁴ connected with the valve H², so that both valves H² and H⁴ can be opened and closed simultaneously by the operator. Each of the cylinders A, A' and A², A³ is provided with a sparking plug J or other device for igniting the charge in the outer end of the corresponding cylinder.

The operation is as follows: When the several parts are in the position as illustrated in Figs. 1, 2, 3, 4 and 5, then the valve plug F' of the valve F for the cylinders A and A' connects, by its port *b*, with the port *c* opening into the cylinder A, while the port *c'* for the cylinder A' is cut off. The cylinder A', however, is connected by the port *e* with the port *d'* (see Fig. 5) opening into

the exhaust chamber F^4 . Now, the motive agent entering the chamber F^3 of the valve F for the cylinders A and A' passes into the cylinder A , to be ignited therein by the igniting device J so as to give an impulse to the piston B in the cylinder A to rotate the shaft E . At the same time the piston B in the cylinder A' is on the return stroke, so that the gases of the previous explosion pass by way of the ports a' and d' into the chamber F^4 and through the pipe H^3 to a suitable place of discharge. While this takes place in the cylinders A and A' , the valve F for the cylinders A^2 and A^3 is about to connect with the cylinder ports, to allow gas to pass into one cylinder, while the products of combustion from the previous explosion in the other cylinder are discharged as soon as the piston is on its return stroke. It is understood that when the pistons B in the cylinders A and A' are at or near the ends of their strokes, then the pistons in the cylinders A^2 and A^3 are in middle position, or nearly so, and one of the same receives an impulse by an explosion. Thus, during each revolution of the shaft E , the latter receives four impulses, one from each of the cylinders A , A' and A^2 , A^3 and the pistons contained therein.

By having each inlet port c , c' provided with a check valve I , it is evident that no back firing takes place at the time a charge is ignited, as the check valve I will close and consequently prevent back firing through the ports c and b into the chamber F^3 of the

valve plug F . It is further understood that the charge passing into a cylinder may have been previously compressed by a suitable pump or other means, so that further compression in the cylinder previous to igniting the charge is not necessary.

Having thus described my invention, I claim as new and desire to secure by Letters Patent:—

In an explosion engine, the combination with the shaft having four cranks, said cranks being arranged at right angles to each other, of two pair of cylinders, pistons in the cylinders, rods connecting the pistons and the cranks, the rods connecting the pistons of each pair with oppositely projecting cranks, a controlling valve for controlling the admission and exhaust for each pair of cylinders, said valve comprising a valve plug provided with an inlet chamber connected with the gas supply, and a port adapted to register alternately with the admission ports for the cylinders, said plug also having an exhaust chamber connected with an exhaust, and having ports adapted to alternately connect with the exhaust ports for the cylinders, and a check valve in each of the admission ports for the said cylinders.

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

GOTTLIEB KELLER.

Witnesses:

F. W. HANAFORD,

EVERARD B. MARSHALL.