

No. 630,213.

Patented Aug. 1, 1899.

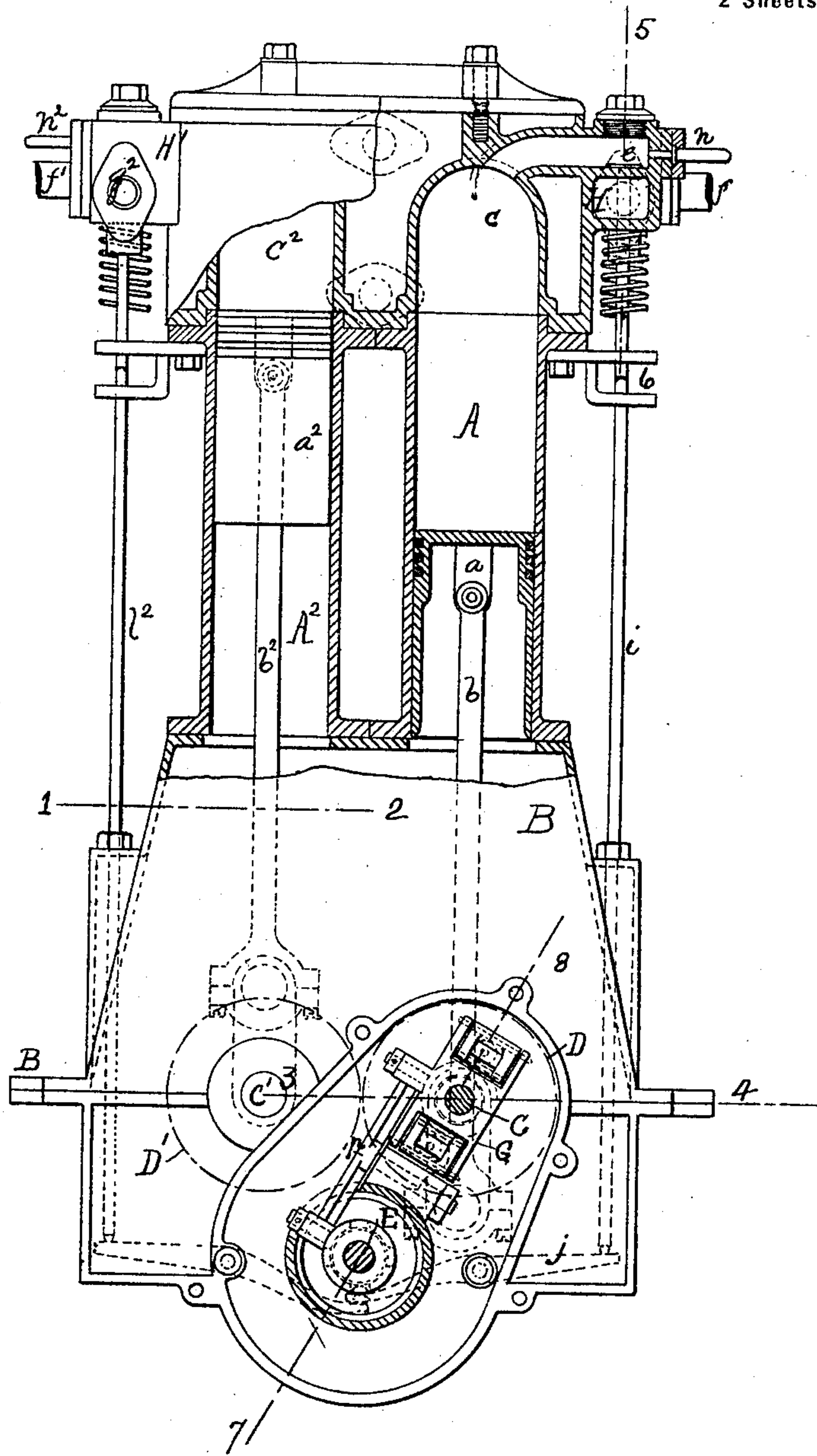
F. P. GAUTIER.
PETROLEUM OR SIMILAR MOTOR.

(Application filed Mar. 20, 1897.)

(No Model.)

2 Sheets—Sheet 1.

FIG. 1.



WITNESSES:

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FIG. 2.

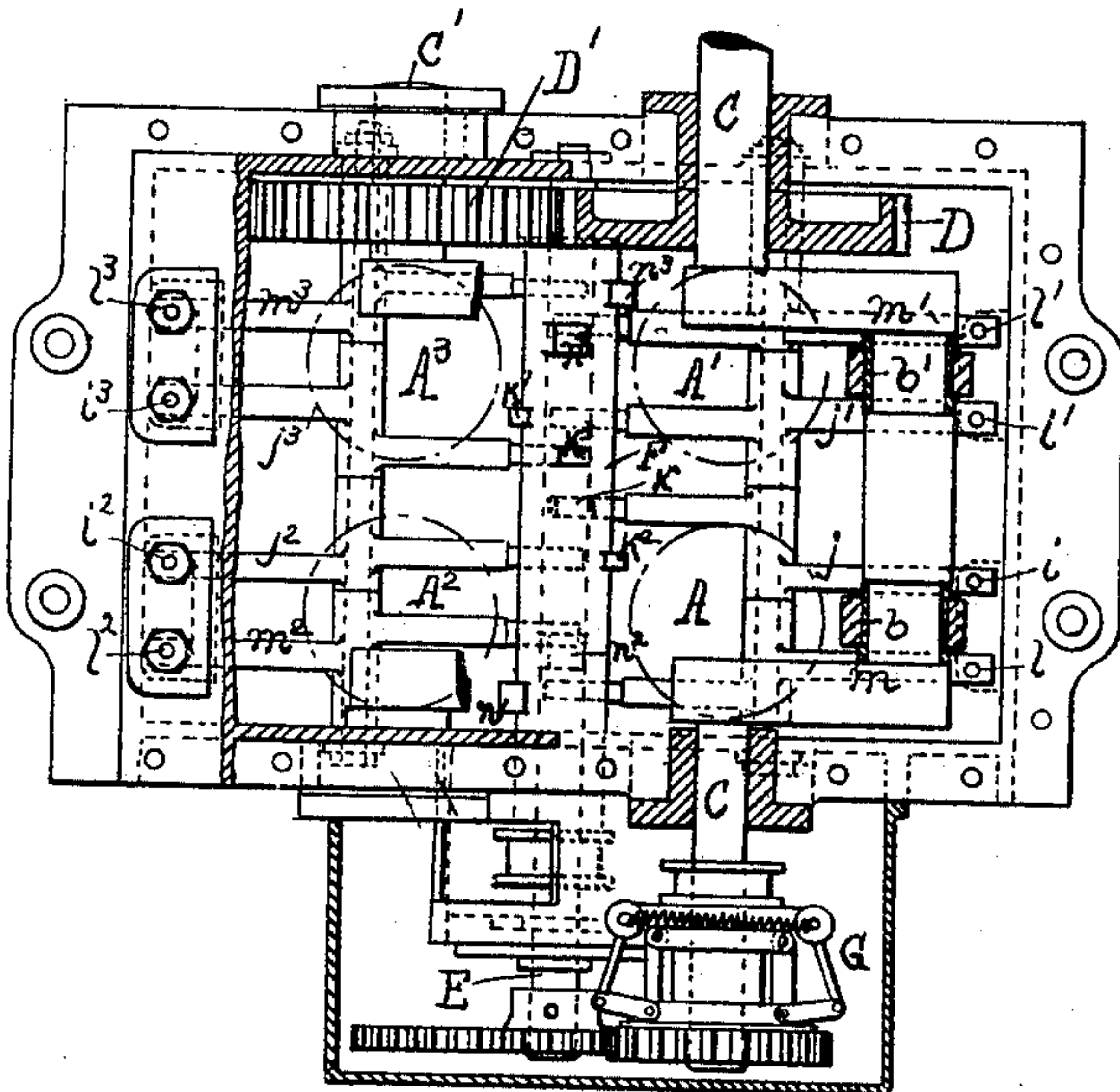


FIG. 4.

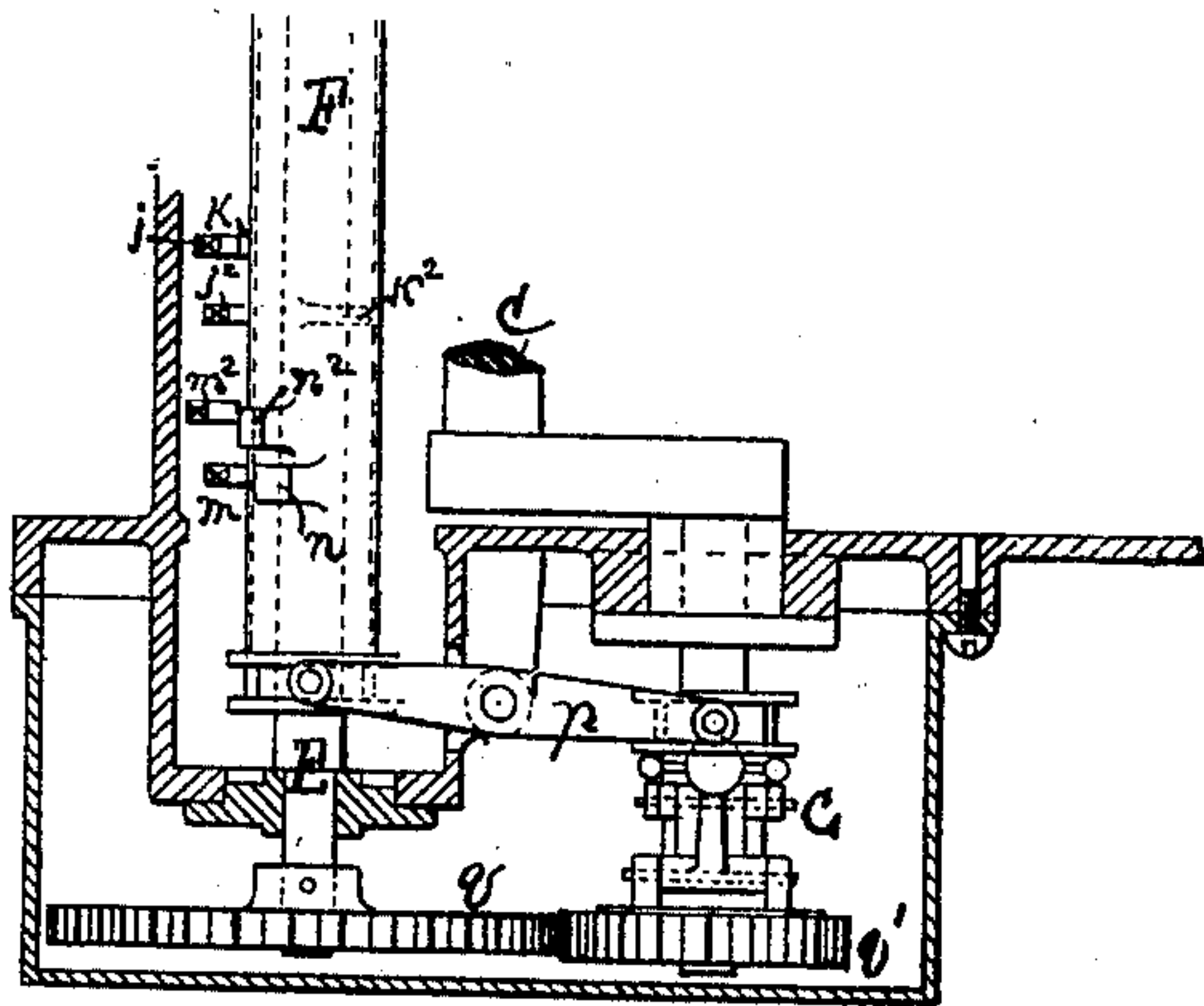
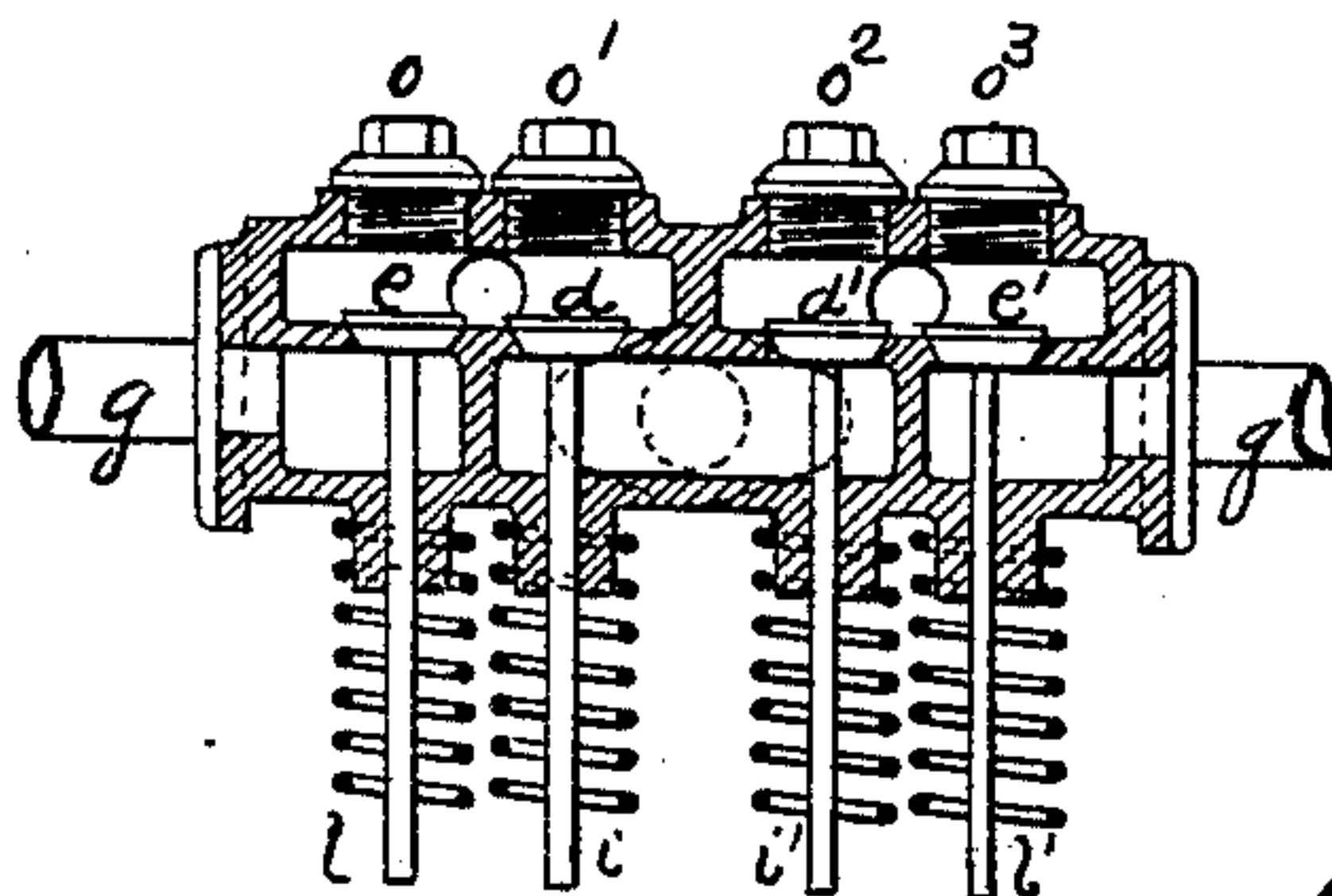


FIG. 3.



WITNESSES:

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UNITED STATES PATENT OFFICE.

FERDINAND PAUL GAUTIER, OF PARIS, FRANCE, ASSIGNOR TO ANTOINE FRANÇOIS DAVID, OF SAME PLACE.

PETROLEUM OR SIMILAR MOTOR.

SPECIFICATION forming part of Letters Patent No. 630,213, dated August 1, 1899.

Application filed March 20, 1897. Serial No. 628,462. (No model.)

To all whom it may concern:

Be it known that I, FERDINAND PAUL GAUTIER, engineer, a citizen of the Republic of France, residing in Paris, France, have invented certain Improvements in Petroleum or Similar Motors, (for which I have secured the following Letters Patent: in France September 17, 1895, No. 250,239; in England January 4, 1896, No. 313; in Belgium June 20, 1896, No. 122,015, and in Germany August 17, 1896, No. 90,785,) of which the following is a specification.

This invention relates to petroleum and similar motors.

The motor which forms the subject of this invention is represented in the accompanying drawings, in which—

Figure 1 is a vertical section of the whole motor in question. Fig. 2 is a horizontal section on the line 1 2 3 4 of Fig. 1. Fig. 3 is a section of the valve-box on the line 5 6 of Fig. 1, and Fig. 4 is a section through the governor on the line 7 8 of Fig. 1.

The improved motor comprises four cylinders $A A' A^2 A^3$, mounted upon a base B of appropriate shape and inclosing two crankshafts C and C' , connected by means of pinions D and D' in such a manner that one only is utilized as the motor-shaft. In this base is also mounted a shaft E , carrying a sleeve F , adapted to turn with the shaft, but free to slide longitudinally thereon under the control of the governor G , which is mounted on the motor-shaft C . Each cylinder incloses a piston a , (a' , a^2 , or a^3), whose connecting-rod b (b' , b^2 , or b^3) is connected either to the crankshaft C or the crankshaft C' . Each cylinder is surmounted by an explosion-chamber c , (c' , c^2 , or c^3), having at the side two valves d (d' , d^2 , d^3) and e (e' , e^2 , e^3) acting from below upward under the influence of a suitable spring and serving one for the admission of gas arriving through the inlet-pipe f (or f') and the other for the discharge of the burned gases, which flow through the discharge-pipe g , (g' , g^2 , or g^3). The pistons $a a'$ on one side are coupled to the shaft C , and the pistons $a^2 a^3$ on the other side are coupled to the other shaft C' , and the cranks of these two shafts are arranged at an angle of one hundred and eighty degrees to each other.

The admission-valves $d d'$ and the valves $e e'$ for the discharge are arranged in one and the same box H , on which the inlet and discharge pipes f and $g g'$ are arranged. The said box is separated into two by a horizontal diaphragm, serving as a seat for the valves, and by vertical partition-walls, which isolate the two cylinders and the different valves, as indicated in Fig. 3. The same is the case with the valves $d^2 d^3$ and $e^2 e^3$ on the other side, which are arranged in one and the same box H' for the use of the cylinders A^2 and A^3 .

Each explosion-chamber has a platinum tube h , h' , h^2 , or h^3 for the ignition of the admitted gas, and these tubes are raised to red heat by the aid of a small Aelopile lamp or by a lamp of any other suitable kind.

The admission-valves are rigid with rods $i i' i^2 i^3$, which are suitably guided and are preferably in two sections, as shown in Fig. 1. The lower parts of these rods rest upon levers $j j' j^2 j^3$, which oscillate upon a suitably-supported axis in the base and bear at their opposite extremities upon cams $k k' k^2 k^3$ on the aforesaid sleeve F , connected to the governor, as above stated. The rods $l l' l^2 l^3$ of the discharge or exhaust valves rest upon levers $m m' m^2 m^3$, bearing upon cams $n n' n^2 n^3$. It should be observed, however, that the cams of the discharge or exhaust valves are larger or wider than those of the admission-valves, so that when, under the influence of the governor, the cam-sleeve is being displaced the exhaust-valves remain always in communication with their respective cams, whereas the admission-valves are prevented from being acted upon by their cams. It should also be observed that the cam-sleeve F is constantly pressed toward the governor by means of a spring.

The motor-pistons move in pairs. The gas and the air which feed one pair arrive at the inside of the compartment provided between the two explosion-chambers of this pair and pass into the cylinders each time when the admission-valves are lifted under the action of the corresponding cams of the cam-sleeve. When the speed increases, the sleeve becomes longitudinally displaced, and its cams for actuating the admission remain no longer in communication with the levers of the admis-

sion-valves. These valves in this case remain closed, and the gas no longer enters the explosion-chambers, while, as has hereinbefore been stated, the exhaust-valves continue their

5 action.

The holes provided in the boxes H H' above the valves and closed by stoppers o o' o^2 o^3 o^4 serve to facilitate the operations of dismantling and cleaning the valves.

10 The connection between the two crank-shafts C C' has the advantage of presenting a perfect equilibrium in the movement of the pistons and of the said shafts.

The governor is keyed upon the shaft C and
15 transmits end movement to the cam-sleeve F by the aid of a small lever p , engaging at one extremity with the slide of the governor and at the other with that of the sleeve F. The shaft of this sleeve carries a toothed wheel
20 q , driven by another, q' , fixed to the governor and of about half the diameter of the former.

In conclusion it must be understood that I do not limit myself to the forms and dimensions of each of the constituent parts of my
25 motor device, and the said motor may be con-

structed of any size and may be used for any purpose and need have only one single pair of motor-pistons, if found preferable.

I claim as my invention—

A petroleum or like motor having a plu- 30
rality of motor-cylinders, two crank-shafts, said cylinders arranged in two rows over the crank-shafts, means gearing the crank-shafts together, a governor on one of the crank-
35 shafts, a third shaft parallel with the crank-shafts and adapted to be rotated by one of them, a sleeve adapted to move longitudinally on the third shaft, exhaust and inlet valve
40 cams on the sleeve, the said governor adapted to move the sleeve longitudinally and inlet and exhaust valves and levers operated by the cams, substantially as described.

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

FERDINAND PAUL GAUTIER.

Witnesses:

EDWARD P. MACLEAN,
LENI FRAMKURL.