

C. ENRIETTI.

MOTOR.

APPLICATION FILED JAN. 29, 1907.

925,318.

Patented June 15, 1909.

Fig. 1.

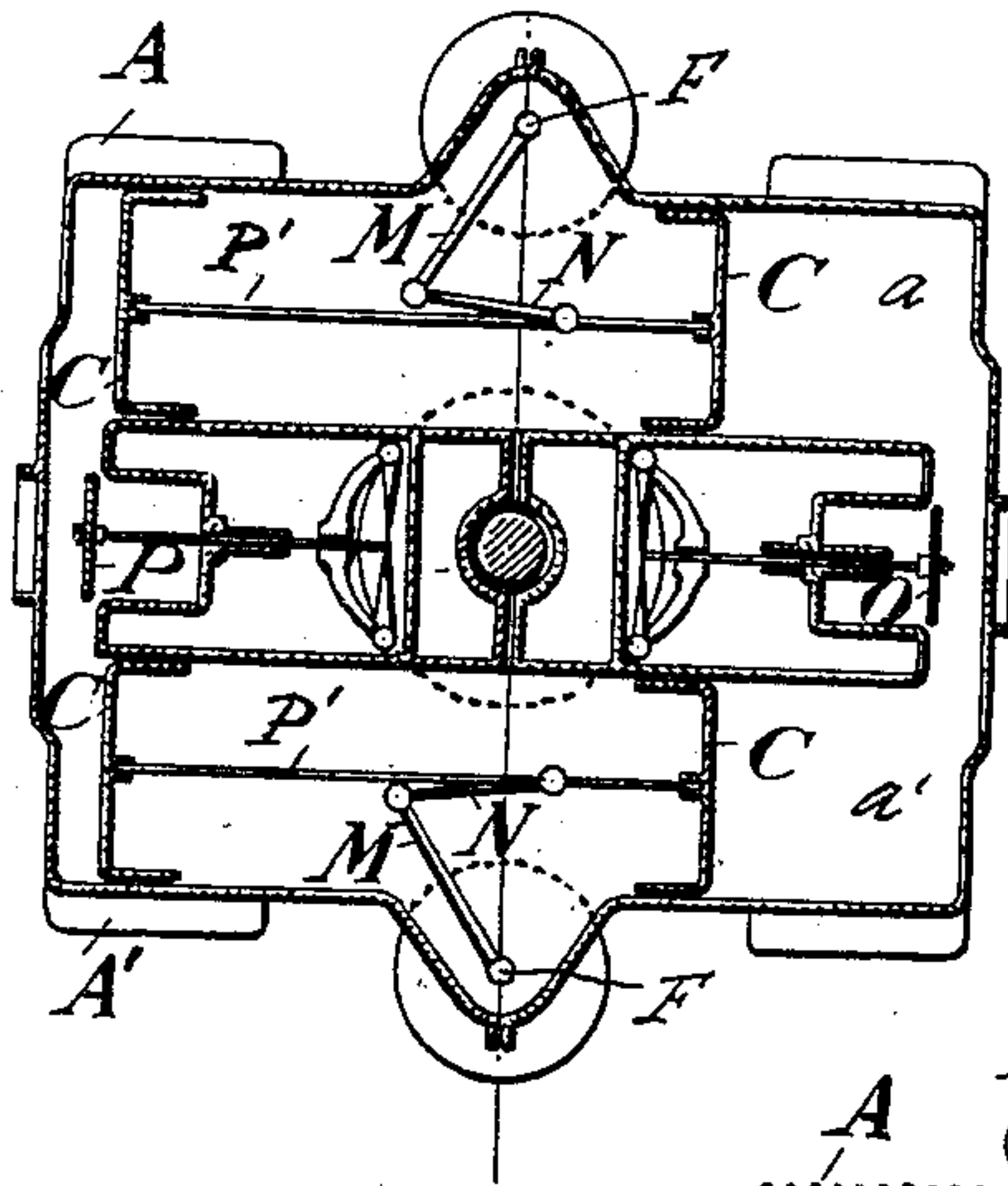


Fig. 2.

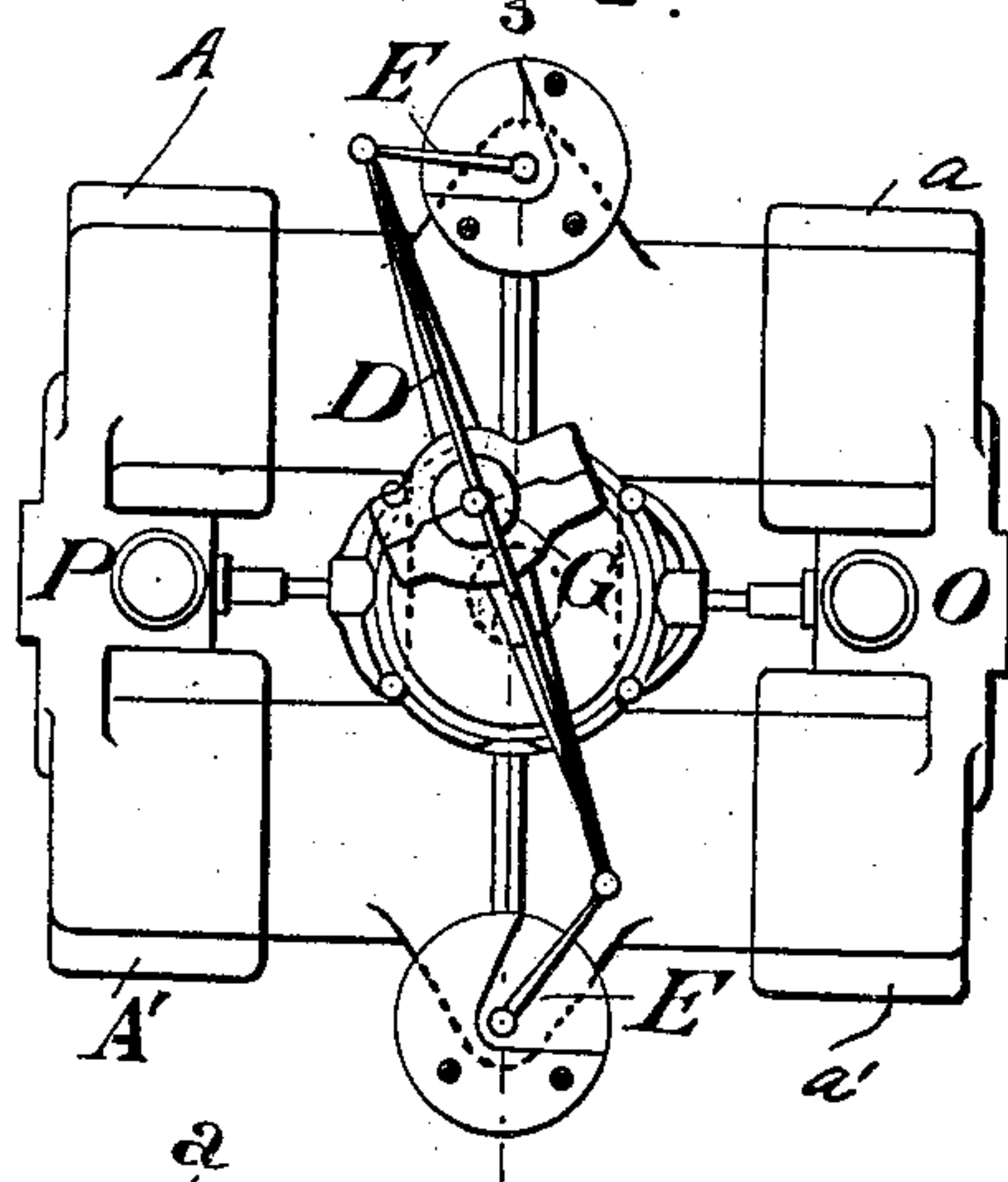


Fig. 3.

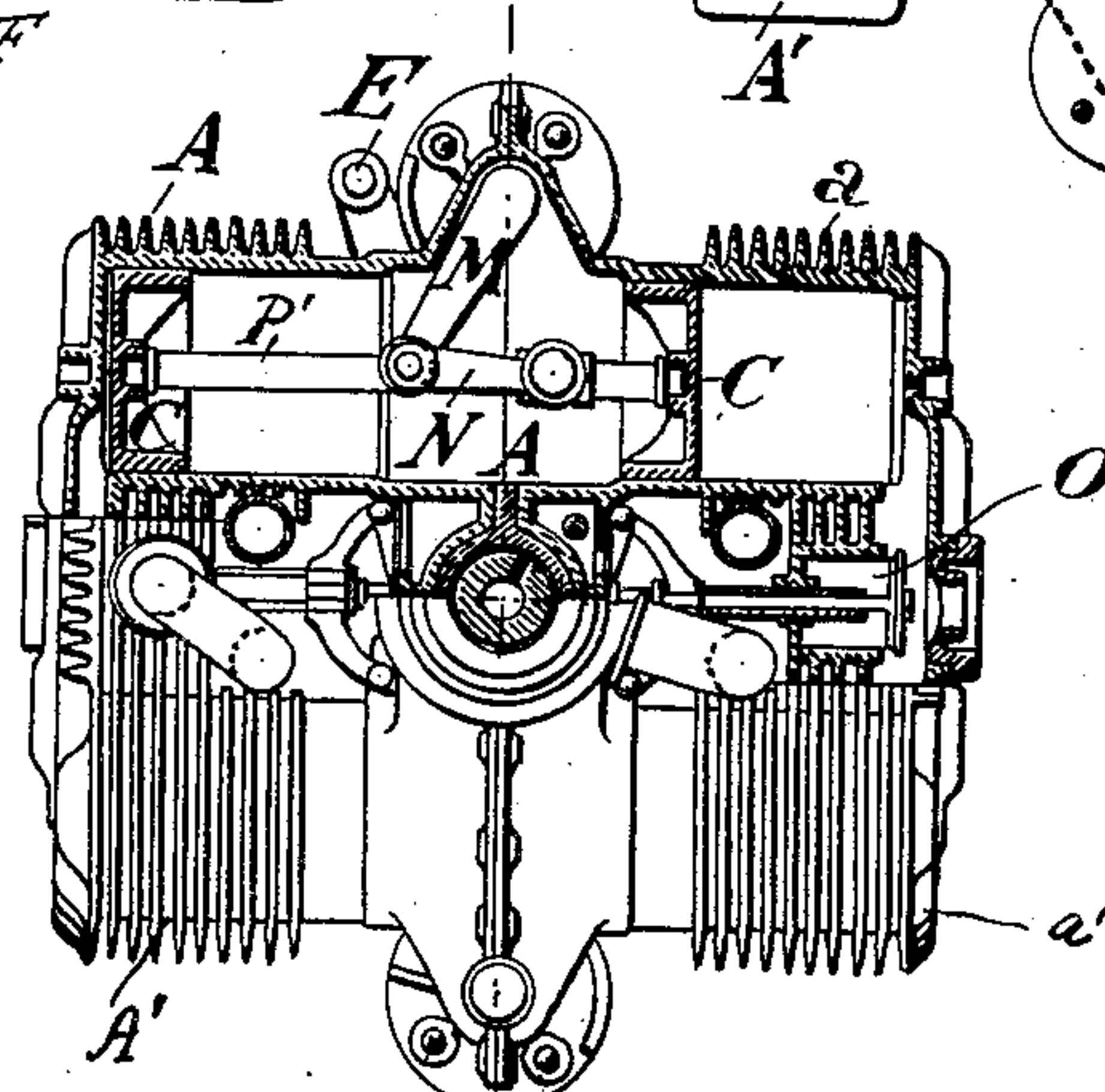
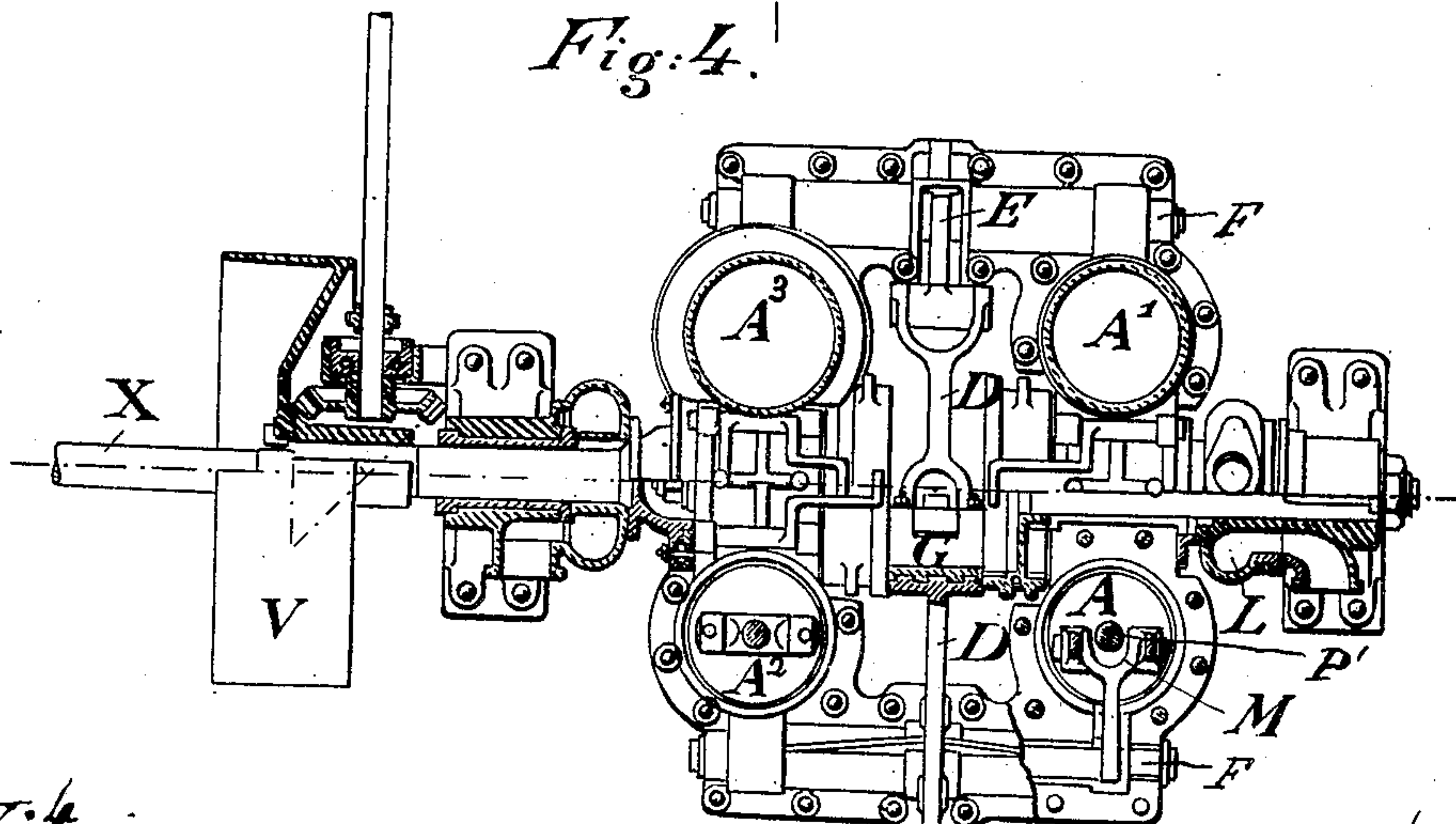


Fig. 4.



Witnesses:
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UNITED STATES PATENT OFFICE.

CARLO ENRIETTI, OF NAPLES, ITALY.

MOTOR.

No. 925,313.

Specification of Letters Patent.

Patented June 15, 1909.

Application filed January 29, 1907. Serial No. 354,770.

To all whom it may concern:

Be it known that I, CARLO ENRIETTI, a subject of the King of Italy, residing at 33 Piazza della Borsa, Naples, in the Kingdom of Italy, industrial, have invented certain new and useful Improvements in Motors of the "Ales" Type, of which the following is a specification.

This invention has reference to eight cylinder internal combustion engines.

The object of the invention is to provide an engine of this type which will present the maximum of lightness and power in a minimum of space while the hereinafter described arrangement of transmission members under the invention lends itself to uniformity of movement with reduction in weight of the fly-wheel, or even its complete elimination.

To these ends the invention consists in the novel and improved constructions which I will now proceed to describe and claim.

The motor may have the main shaft arranged at the center of the group of cylinders or below the same as may be seen from the accompanying drawings, in which:—

Figure 1 represents a vertical diagrammatic section of the motor with the main shaft at the center of the group of cylinders. Fig. 2 is a diagrammatic view of Fig. 1 in elevation. Fig. 3 is a view of the motor in elevation, a part of which is in vertical section and shows the constructional details. Fig. 4 is a sectional plan view of the motor taken at various heights in order to show the constructional details.

Referring to the construction illustrated in Figs. 1 to 4, the cylinders A A', a, a' are arranged one opposite to the other in the same plane. Further cylinders A², A³ (Fig. 4) a² a³ (not shown) are also arranged one opposite to the other in the same manner as the aforesaid group of four cylinders. The two groups of four cylinders are then arranged in two parallel planes so as to form a perfectly balanced and compact group of eight cylinders. The pistons C of each pair of oppositely arranged cylinders are connected together by common connecting rods P' to which are connected intermediate transmission members N, M which transmit the movement of said connecting rods P' to a longitudinal shaft F, journaled in the casing and to which is connected a lever E through which the power is transmitted from said longitudinal shaft to a lever or cross-beam D mounted on a crank G of the main shaft X

which in this case is arranged centrally of the group of cylinders. The crank G is sufficient for all the eight cylinders and the explosions take place two by two at every half revolution. Valves O are provided for the cylinders a a' and valves P for the oppositely arranged cylinders A A' (Figs. 1, 2 and 3). These valves are actuated by any suitable means and it will be understood that any suitable valve system might be employed.

In the construction described the cylinders being oppositely arranged in pairs, guides are dispensed with as the pistons mutually guide each other. The pistons may be made very thin and of light construction, in fact only of the thickness required to allow for the necessary packing. The cylinders may be considerably shortened to still lessen the total weight of the engine to obtain the full advantage of lightness and compactness, while all the parts are compactly grouped and disposed to completely and perfectly utilize the available space, the engine taking the least room possible, thereby resulting in extreme simplicity, lightness, and accessibility of the parts.

The type with the crank shaft situated at the center of the apparatus (which arrangement may have rotary cylinders with a fixed shaft) may be employed for automobiles, and for all nautical, aeronautical and industrial uses and for any other application.

The cylinders may have radiating surfaces for air cooling as shown in Fig. 2.

What I claim is:—

1. An internal combustion engine comprising eight compactly grouped single-acting cylinders oppositely arranged in pairs, and a single crank shaft therefor disposed between and centrally of said cylinders the different pairs of cylinders being placed in parallel planes and the pistons of each pair being rigidly connected by means of single piston rods, to which are connected transmission members whereby the movements of said piston rods are transmitted to the main shaft.

2. An internal combustion engine comprising eight compactly grouped single-acting cylinders oppositely arranged in pairs, the different pairs of cylinders being placed in parallel planes and the pistons of each pair being rigidly connected by means of single piston rods, to which are connected transmission members whereby the movements of said piston rods are transmitted

to a beam carried by a crank on the main shaft which is arranged centrally of the group of cylinders.

3. An improved explosive engine having
5 eight compactly grouped single-acting cylinders opposed two by two to one another on the same axis and placed one above another with parallel axes, pistons for each pair, pivotally united transmission members
10 rigidly connecting the pistons of each pair, means pivoted to members at one end, a cross beam at the other end connecting the

four cylinders in one plane and mounted for oscillation, a main shaft, two cranks thereon and a similar connection between one of said cranks and the pistons of the other cylinders. 15

In testimony whereof I affix my signature in presence of two witnesses.

CARLO ENRIETTI.

Witnesses:

G. SWANCUI,
A. ROGGI.