No. 852,033. PATENTED APR. 30, 1907.

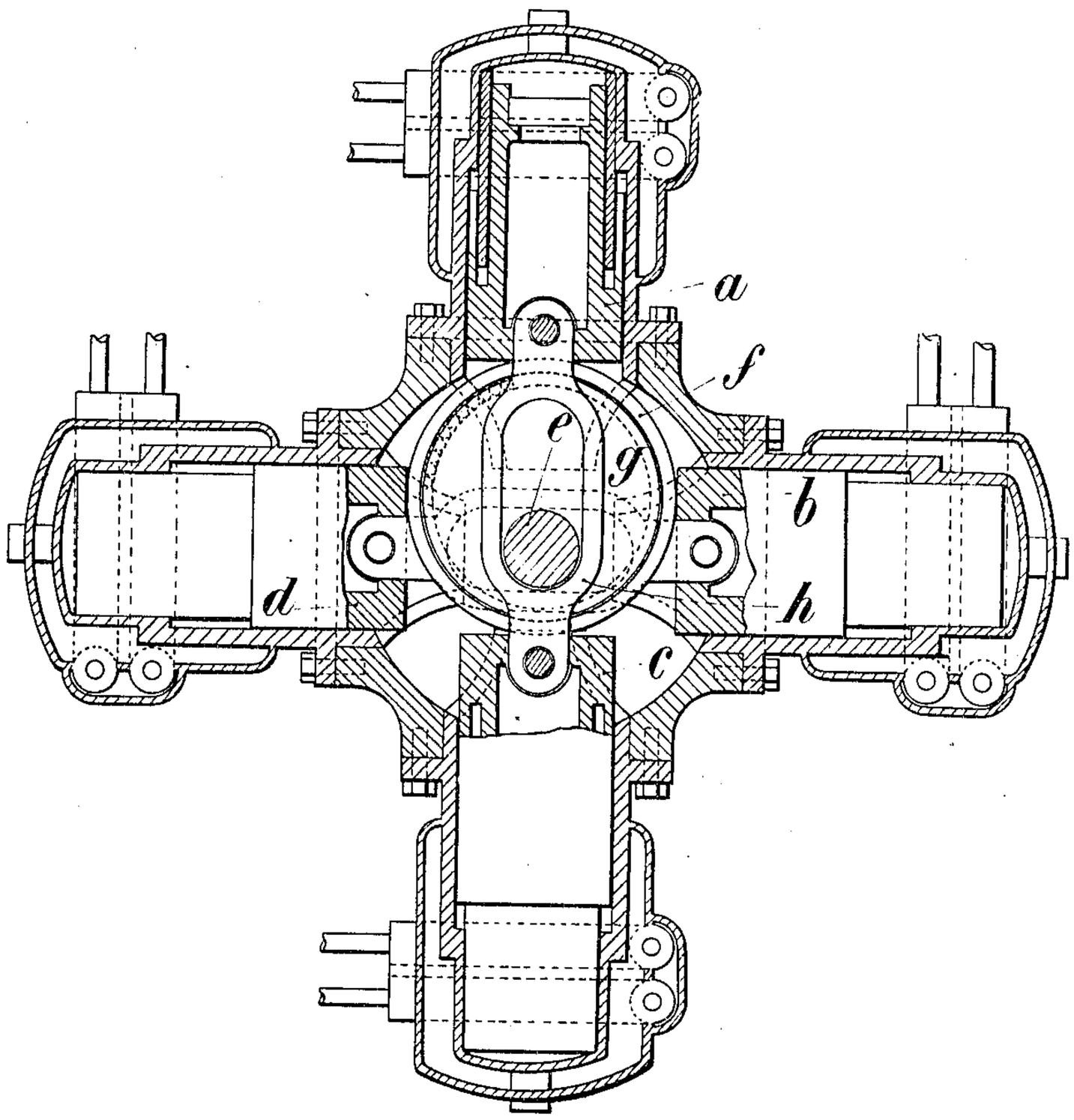
R. PHILIPPE.

MOTOR.

APPLICATION FILED NOV. 6, 1905.

2 SHEETS—SHEET 1.

Fig. 1.



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2 SHEETS—SHEET 2.

Fig. 2.

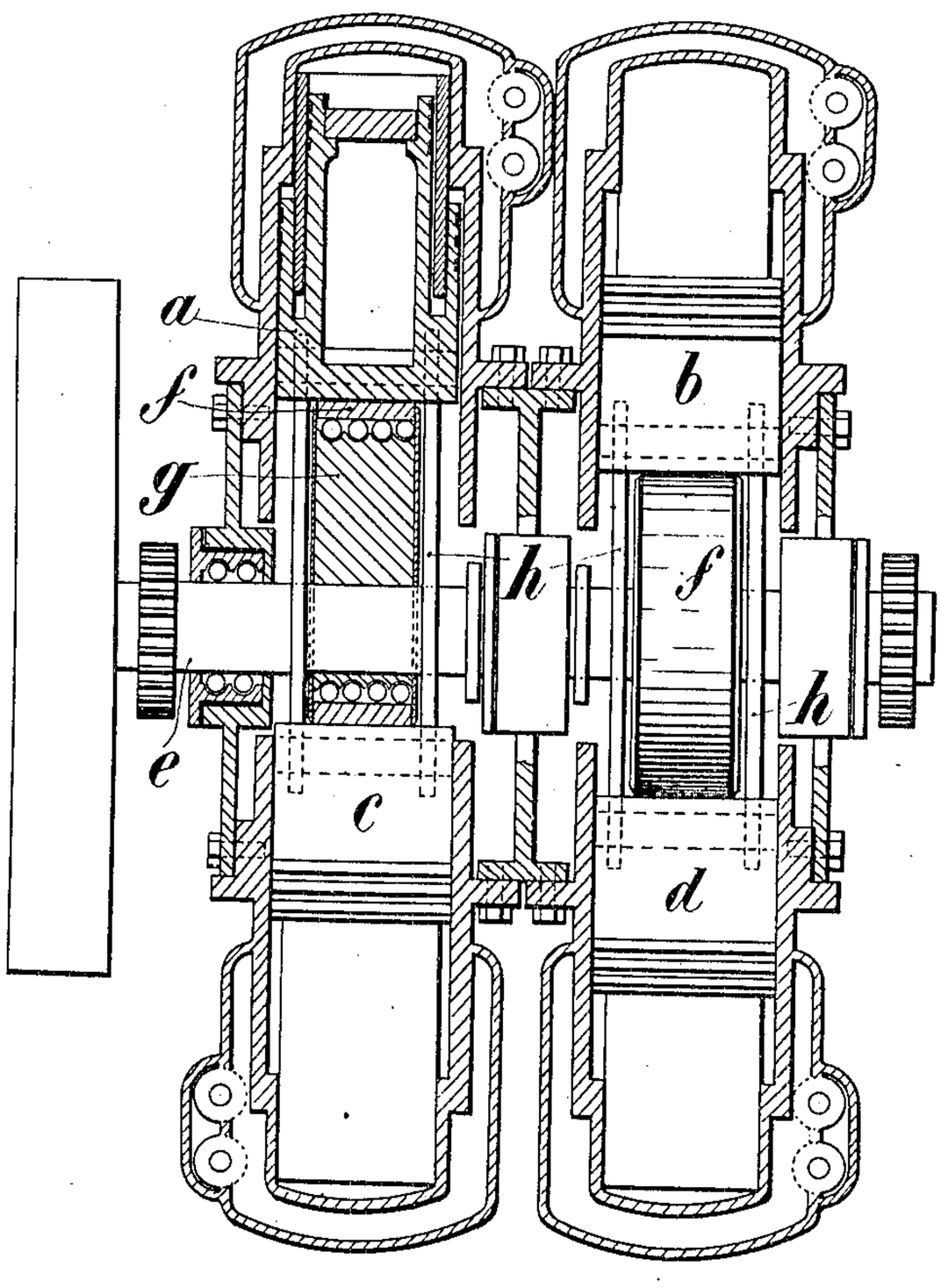
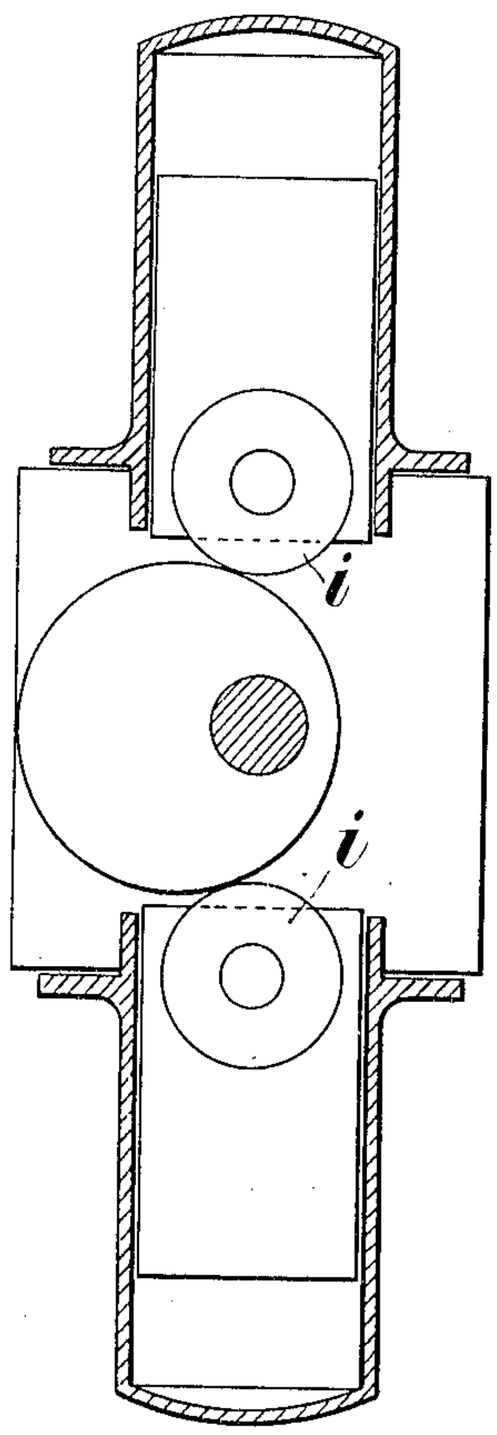


Fig. 3.



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No. 852,033. Specification of Letters Patent. Patented April 30, 1907.

Application filed November 6, 1905. Serial No. 286,160.

To all whom it may concern:

Be it known that I, RAOUL PHILIPPE, a citizen of the French Republic, residing at Paris, in the Department of the Seine, France, have invented certain new and useful Improvements in Prime Motors, of which the following is a specification.

This invention relates to prime motors, propelled by either oil, gas, steam, compressed air or water under pressure. Its object is to enable single acting or double acting motors, with either one, two or four cylinders, to be operated without connecting rods, or cranks, and at very high speeds, giving a perfect rotary motion without thumps or vibrations when running. The same construction is capable of use as a pump or a liquid meter.

In the accompanying drawings, Figure 1 is a transverse cross section of a four cylinder engine embodying my invention. Fig. 2 is a longitudinal cross section of a four cylinder engine having the cylinders set in pairs side by side, and Fig. 3 shows a further modification.

Referring first to Fig. 1, the four cylinders are shown located in the same plane and spaced ninety degrees apart, concentric to the shaft *e*. In each cylinder is a piston, *a*, *b*, *c*, *d*. The pistons *a*, *c*, are connected together by links *h*, which are slotted to let the shaft pass through without interfering with the reciprocation of the pistons. The pistons *b*, *d*, are similarly connected. On the shaft, in line with the pistons, is keyed an eccentric *g*, and surrounding said eccentric is a ring *f* mounted on ball bearings so as to revolve easily thereon. The ring just fills the space between the inner ends of the pistons, which are wide enough to engage said ring at diametrically opposite points at all times. When steam is admitted behind said pistons in succession, they cause the eccentric to rotate and thus drive the shaft.

In the modification shown in Fig. 2, the pistons *b*, *d*, lie side by side with the pistons *a*, *c*, respectively, and each pair of pistons engages its own eccentric. The two eccentrics are set quartering on the shaft, so that as the steam is admitted first to the two upper pistons and then to the two lower ones, the shaft will be given an impulse at each quarter revolution.

Fig. 3 shows another modification in which the ring is omitted and the ends of the pistons are provided with rollers *i* which bear directly against the periphery of the eccentric.

Having thus described my invention what I claim is:—

1. The combination with a shaft, of a plurality of eccentrics secured thereon and set quartering, a ring concentric with each eccentric, balls between each ring and its eccentric, a pair of pistons bearing against each ring at diametrically opposite points, and links connecting said pistons and provided with slots for the shaft to pass through.

2. The combination with a shaft, of eccentrics secured thereon and set quartering, a ring revoluble on each eccentric, a pair of pistons bearing against each ring at diametrically opposite points, said pistons being arranged in pairs side by side, and slotted links connecting said pistons in each pair.

In testimony whereof I have hereunto set my hand in presence of two subscribing witnesses.

RAOUL PHILIPPE.

Witnesses:
HENRY DANZER.
LUCIEN CRESPIN.