June 19, 1923.

1,458,950

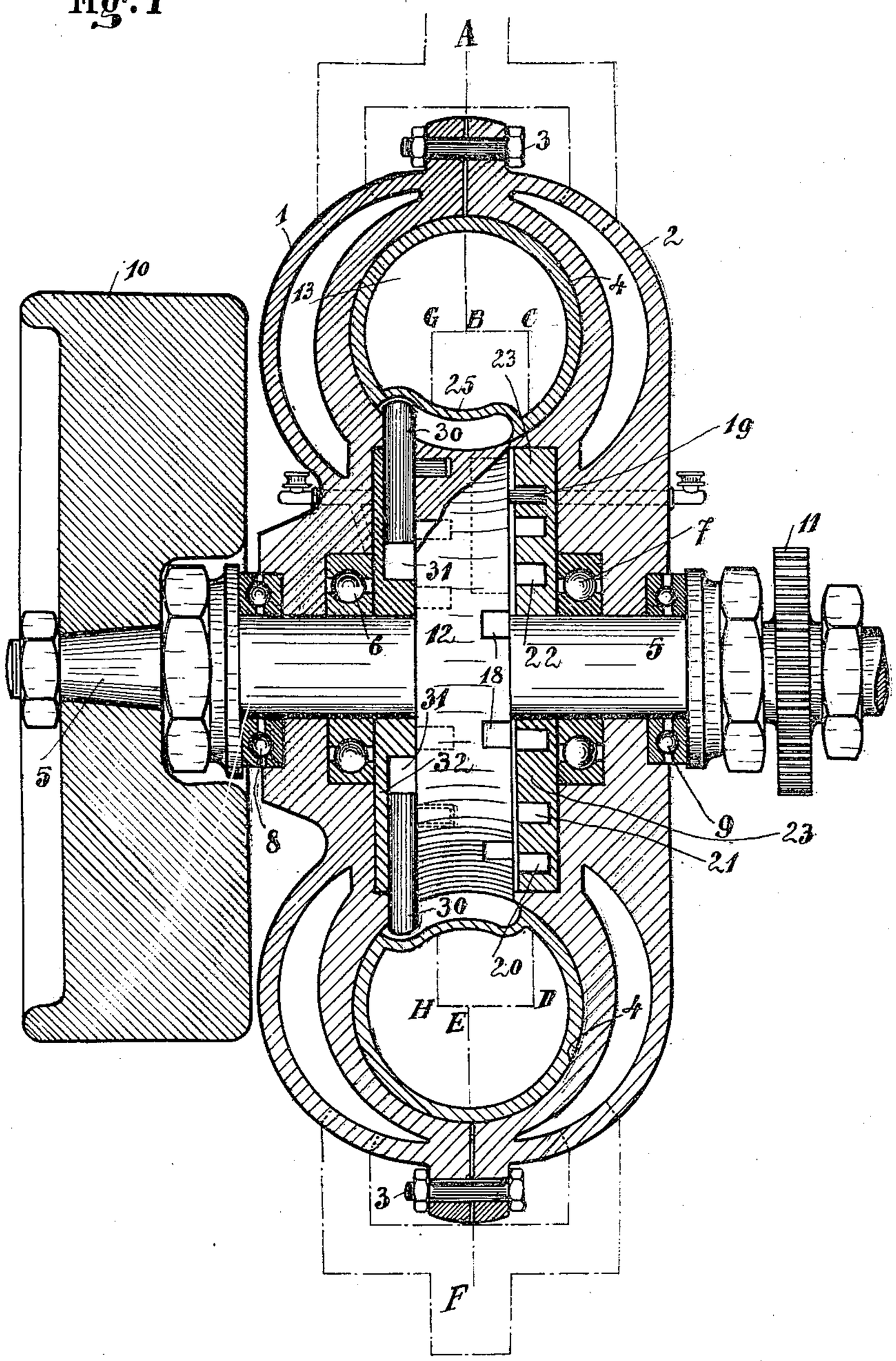
L. I. POIRMEUR

EXPLOSION ROTATING ENGINE

Filed Feb. 13, 1920

4 Sheets-Sheet 1

Fig. 1



Inventor

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his Attorneys

June 19, 1923. **1,458,950**

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EXPLOSION ROTATING ENGINE

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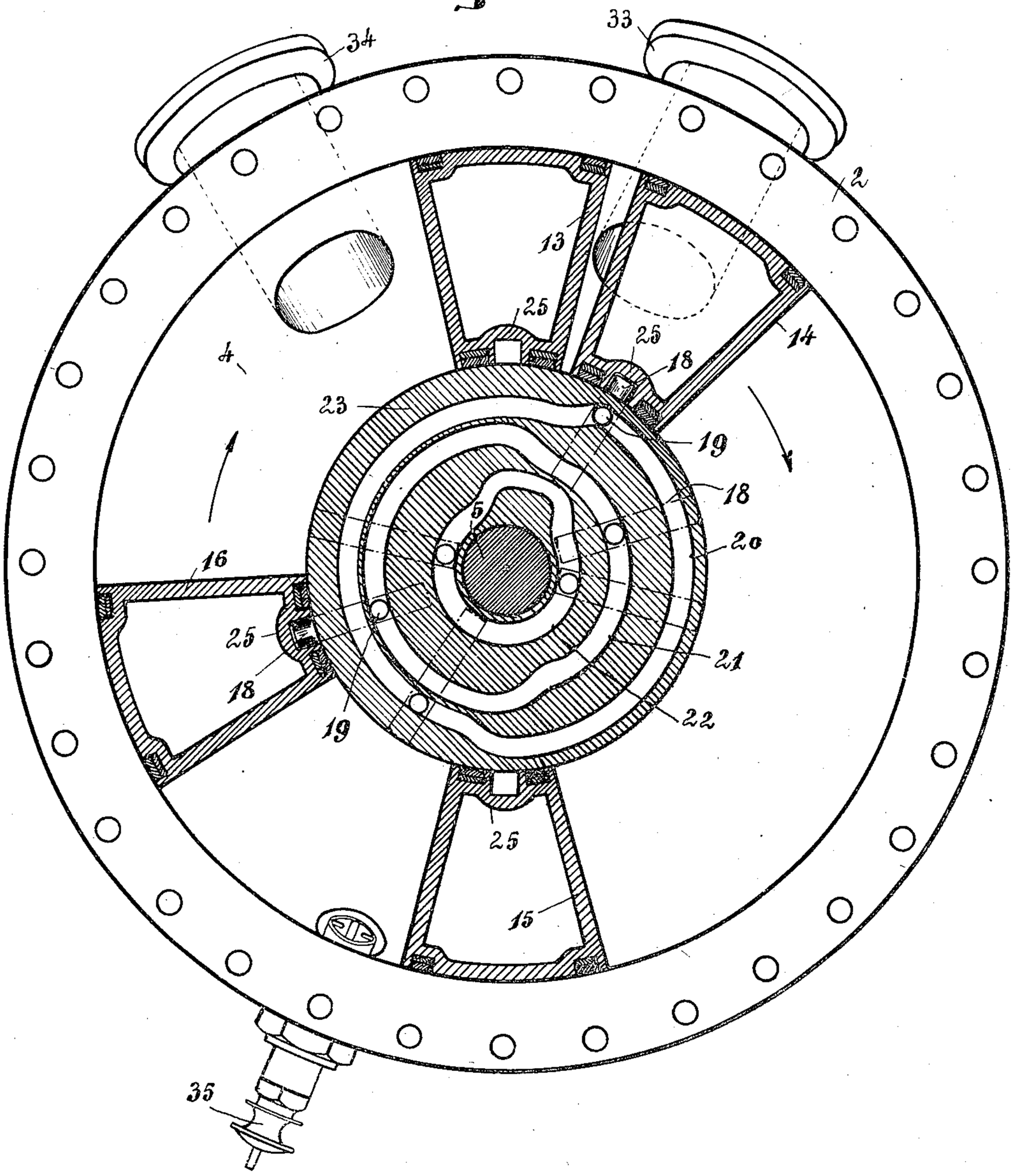
Fig. 2



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June 19, 1923. 1,458,950

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EXPLOSION ROTATING ENGINE

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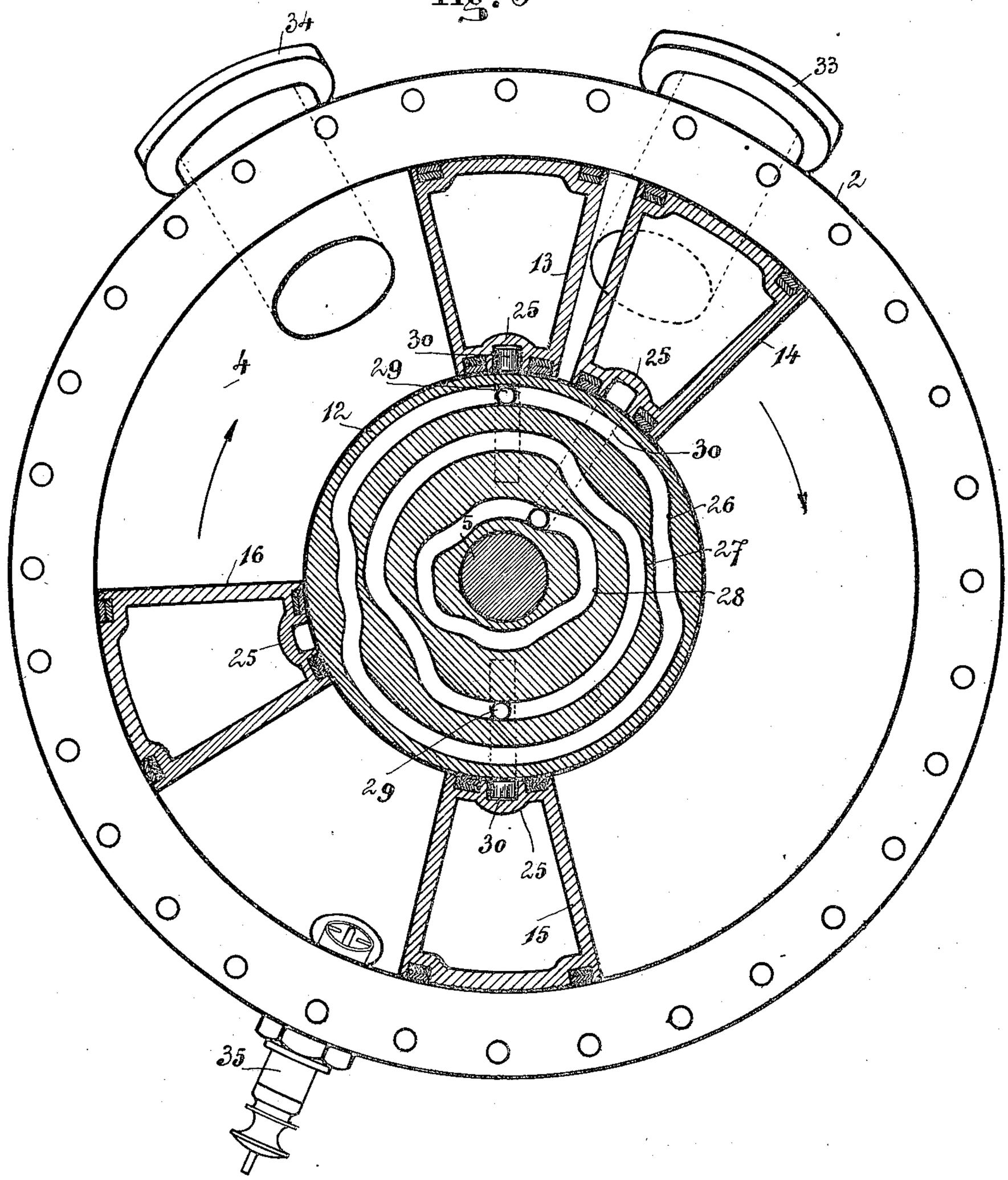
Fig. 3



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June 19, 1923. 1,458,950

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EXPLOSION ROTATING ENGINE

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Fig. 4

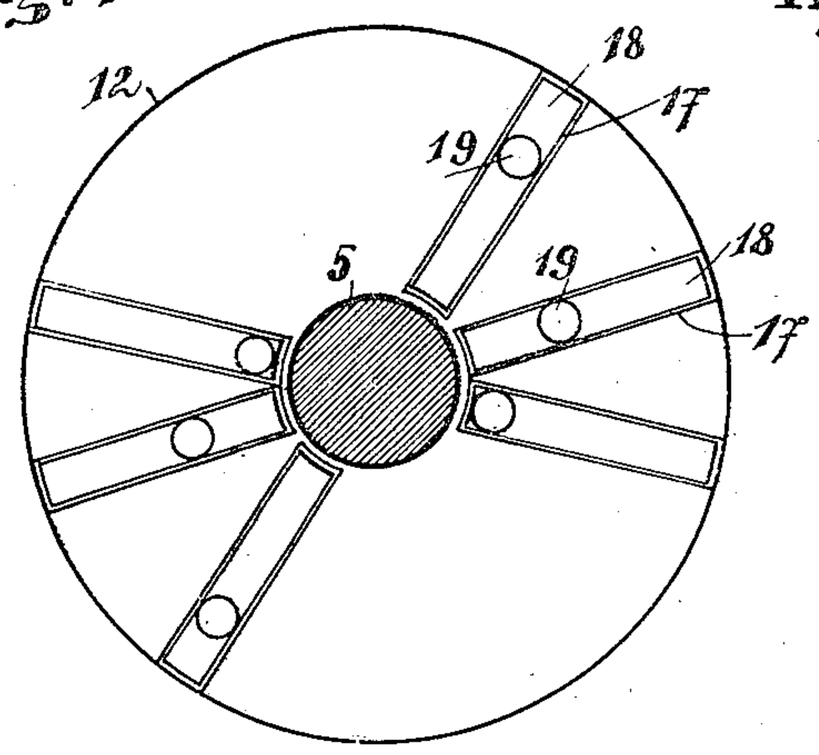


Fig. 5

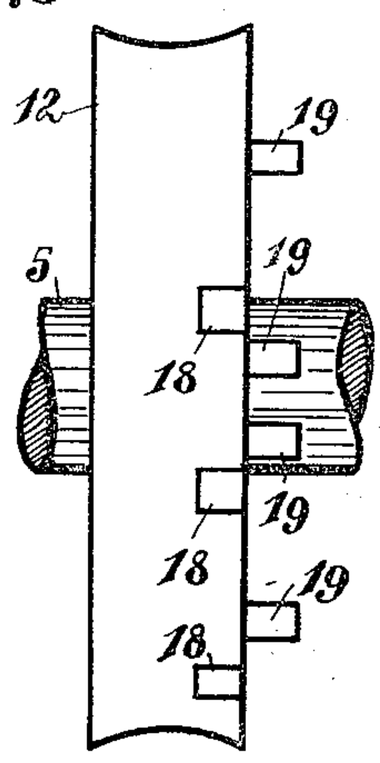


Fig. 8

Fig. 6

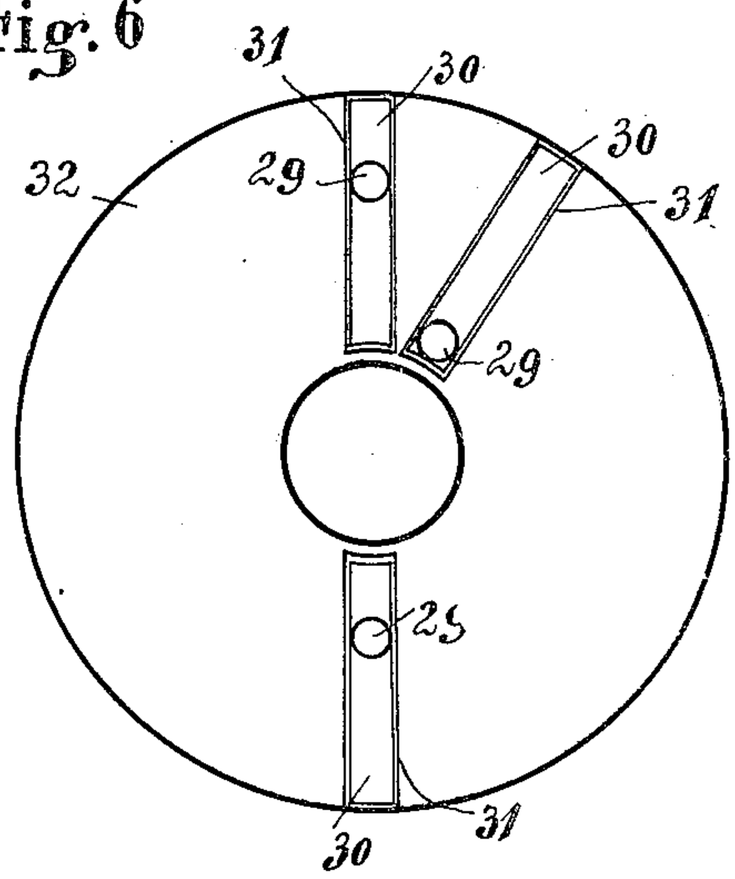
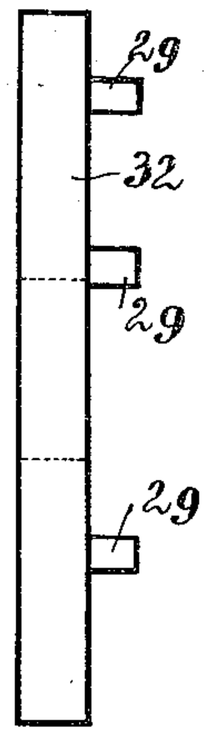


Fig. 7



Inventor

Louis Ildevert Poirmeur

by Otto Munn

his Attorney

Patented June 19, 1923. 1,458,950

UNITED STATES PATENT OFFICE.

LOUIS ILDEVERT POIRMEUR, OF MERU, FRANCE.

EXPLOSION ROTATING ENGINE.

Application filed February 13, 1920. Serial No. 358,427.

To all whom it may concern:

Be it known that LOUIS ILDEVERT POIRMEUR, citizen of the French Republic, residing at Meru, Oise, France, has invented certain new and useful Improvements in Explosion Rotating Engines, of which the following is a specification.

This invention relates to improvements in rotary explosion engines, and the object of the invention is to make a simple rotary engine driven by the explosion of vapor charged air and one that will be inexpensive to build, very light, and efficient in operation.

Another object of this invention is to provide an engine of the above type in which the parts are relatively few and simple and whose operation is very easily understood and controlled.

Another object of this invention is to provide such an engine that is compact in structure, readily and easily installed and effective and reliable under almost any condition of operation.

Other objects will be obvious from the following description, taken in connection with the drawing, which forms part of the specification.

In the accompanying drawings:

Fig. 1 is a vertical section through the rotating engine on the line of the drive shaft.

Fig. 2 is a section on the line A, B, C, D, E, F, Fig. 1.

Fig. 3 is a section on the line A, B, G, H, E, F, Fig. 1.

Fig. 4 is a detail showing pawls and pawl slots associated with disk 12.

Fig. 5 is a view of the parts shown in Fig. 4, looking at right angle thereto.

Fig. 6 is a detail showing the pawls and pawl slots associated with the cylinder casing.

Fig. 7 is a view of the parts shown in Fig. 6, looking at right angle thereto.

Fig. 8 is a perspective view of one of the pawls.

The engine is provided with a circular casing composed of parts 1 and 2 bolted together by means of bolts 3. These parts thus fastened together form a circular annular cavity or space 4 constituting the cylinder of the engine. Passing through the center of the casing in openings provided therefor is a rotating shaft 5. Between the shaft and the bearing walls of the casing are interposed ball bearing anti-friction means 6 and 7, and between shoulders on the shaft and the casing are anti-friction thrust means 8 and 9. On one end of the shaft 5 is a fly-wheel 10, while on the other end is a gear 11 for the purpose of driving a magneto, water and oil pumps, and any other transmission. The central part of the casing formed by the sections 1 and 2 is hollowed out to form a cavity in which are located the disk 12, the disk 23 and the disk 32. The disk 23 is permanently attached to the inside wall of section 2 and is provided with cam grooves 20, 21 and 22, shown more clearly in Fig. 2. The disk 32 is provided with radial grooves 31, as shown in Fig. 6. The disk 12 is permanently attached to the shaft 5 and rotates between the disks 23 and 32. On the face of disk 12, adjacent to disk 23 there is provided a series of radial grooves 17 in which are located pawls 18, as shown in Fig. 4. Each of the pawls 18 has a projection 19 fitting into one of the cam grooves in disk 23. On the face of disk 12 adjacent to disk 32 is provided a series of cam slots, as shown in Fig. 3. In each of the radial grooves 31 of disk 32 is located a pawl 30. This pawl 30 is provided with a projection 29 which engages one of the cam slots on the face of the disk 12. Within the annular groove cylinder 4 are located a plurality of disk pistons 13, 14, 15 and 16 which are adapted to move within the said cylinder. Each of these pistons is provided with a socket 25 adapted to be engaged by the pawls 18 and 30. The engagement of these pawls 18 and 30 with the sockets 25 is determined by the cam slot on the disk 23 and the disk 12. The cam slots in the disk 23 and the disk 12 are so arranged in relation to the pawls thereon as to control and properly time the engagement of the pawls with the pistons. It will be readily seen that whenever any pawl 30 engages a socket the corresponding piston is held in fixed relation to the casing. It

will also be noted that when any pawl 18 engages a socket 25 the corresponding piston will be rotatively attached to the disk 12 and thereby to the shaft 5. For the purpose of admitting fuel into the cylinder 4 is an admission pipe 33 connected with a suitable carburetor. There is also connected to the cylinder an exhaust pipe 34 and a spark plug 36.

For an understanding of the operation of this device attention is called to Figs. 2 and 3. As shown in Fig. 2, the pistons 14 and 16 are movable with the shaft 5 due to the engagement of the pawls 18 in the socket 25, while the pistons 13 and 15 are held fixed in relation to the cylinder by means of pawls 30 and socket 25. These pawls 30 as previously mentioned move in slots in the disk 32 permanently secured to section 1 of the casing. In the position of the parts shown in these figures the cylinder between the pistons 14 and 15 is filled with an explosive mixture which is undergoing compression due to the rotation of the piston 14 within the cylinder. As this piston 14 advances due to the explosion which has taken place in the fuel previously compressed between pistons 15 and 16, fuel is taken in through the feed pipe 33 between pistons 13 and 14, at the same time the fuel that has been previously used by explosion is being exhausted from between the pistons 16 and 13 out through the exhaust pipe 34. As the pistons 14 and 16 rotate due to explosion, the piston 14 will assume a position about where piston 15 is in the drawing. Just before the piston 14 reaches the present position of piston 15 the pawl 30 is released from the socket 25 of piston 15 and one of the pawls 18 engages said socket due to the motion of the pawl projection in the slot 22, whereby the piston 15 is moved to a position about where the piston 16 now is, after which the piston 14 assumes the position of piston 15 in Fig. 3 and is locked in that position by one of the pawls 30. At the time this relatively changed position is taking place between pistons 14 and 15, piston 13 has been moved to the position of 14 and the piston 16 has moved to the present position of the piston 13. These changes are regulated by the engagement of the pawls 18 and 30 with the socket 25 and such engagement is determined by the particular shape and location of the different cam slots in which the pins of the pawls engage. From an observation of the shape of these slots it can be readily seen that the engagement of any of the pawls with the socket 25 depends upon what part of the slot the pin at any time is located. By properly adjusting the slots an arrangement can be made for the engagement at any time of any of the cams with any desired socket 25.

Applicant does not wish to be limited to the specific embodiment of his invention as here illustrated, which may be considered only as a preferred form, but only wishes to be limited by the scope of the appended claims.

What I claim is:—

1. In an explosive engine, a casing having an annular cylinder and a central cavity pistons within the cylinder, a shaft extending through said casing and through said cavity, a disk secured to said shaft and adapted to rotate within said cavity, means associated with one face of said disk to lock the pistons in engagement with the casing, means associated with the other face of said disk to lock the pistons in engagement with the disk whereby on rotation of the pistons the shaft will rotate.

2. In an explosive engine, a circular casing having an annular cylinder and a central cavity, said casing being provided at its center with a shaft opening, a shaft rotatably mounted in said shaft opening, a disk upon said shaft and rotatable in said cavity, said disk being provided on one face with radial slots, pawls slidably mounted in said radial slots, projections upon said pawls, cam means for engaging said projections to move said pawls into or out of engagement with the pistons, said disk being provided on its other face with cam slots, pawls mounted in the casing adjacent said disk and adapted to engage the pistons, projections on said pawls and engaging the cam slots of the disk, whereby said last-named pawls may be thrown into or out of engagement with the pistons.

3. In an explosive engine, a casing having an annular cylinder and a central cavity, one wall of said cavity being provided with cam slots and the other wall of said cavity being provided with radial slots, pawls mounted in said radial slots, projections on said pawls, said casing having centrally thereof a shaft bearing, a rotating shaft rotatably mounted in said bearing, a disk upon said shaft and rotating in said cavity, one face of said disk having radial slots, pawls mounted in said radial slots, projections on said pawls and engaging said cam slots, the other face of said disk having cam slots adapted to be engaged by the projections on the pawls mounted in the radial slots of the casing, whereby upon rotation of the shaft the pawls may be thrown into or out of engagement with the pistons.

4. In an explosive engine, a casing having a cylinder and a central cavity, pistons in the cylinder, a shaft extending through said casing and cavity, a disk secured to the shaft and rotating within the cavity, radially moved means associated with one face of the disk and adapted to lock the pistons in engagement with the casing, a second ra-

dially moving means associated with the other face of the disk and adapted to lock the pistons in engagement with the disk.

5. In an explosive engine, a casing having a cylinder and a central cavity, pistons in the cylinder, a shaft extending through said casing and cavity, a disk secured to the shaft and rotating within the cavity, radially moving means associated with the walls of the cavity for locking the pistons in engagement with the casing, and a second radially moving means associated with another face of the cavity to lock the pistons in engagement with the disk.

In testimony whereof I affix my signature.

LOUIS ILDEVERT POIRMEUR.