July 7, 1931. J. B. GROH 1,813,288

RADIAL POWER DEVICE

Filed Oct. 15, 1929

Fig. 1

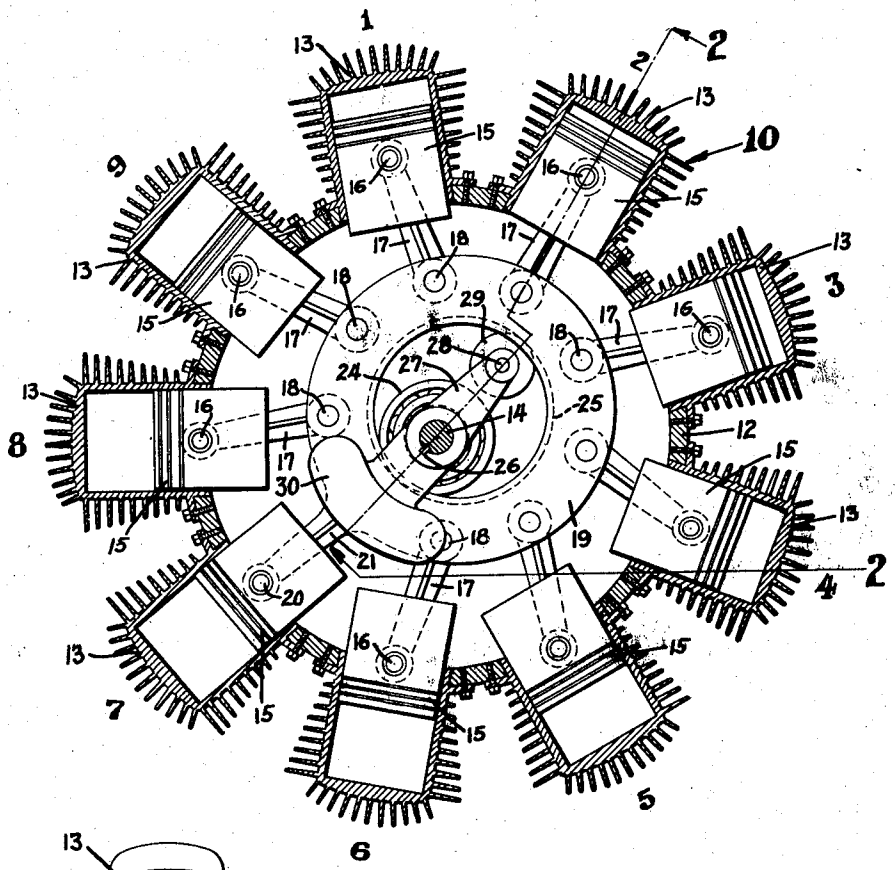
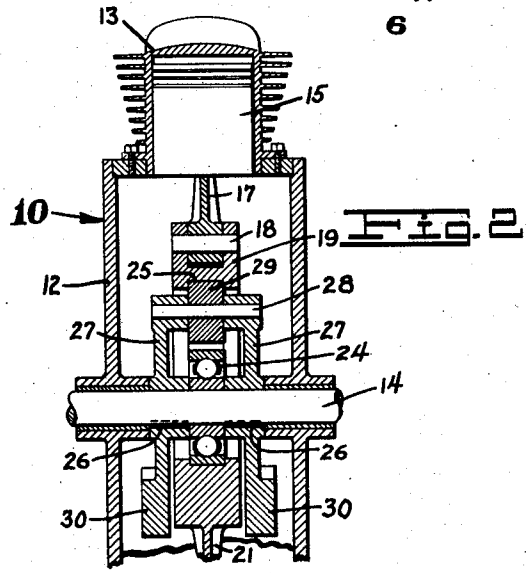


Fig. 2



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RADIAL POWER DEVICE

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This invention relates to improvements in prime movers.

The general object of this invention is to provide an improved power mechanism of the radial type.

A specific object of the invention is to provide a radial engine wherein the use of an offset crank is avoided.

Another object of the invention is to provide an engine of the radial type which includes a plurality of cylinders having the pistons therein connected to a ring which is oscillated by the action of the pistons and wherein the oscillating movement is employed to rotate a drive shaft.

Other objects and the advantages of this invention will be apparent from the following description taken in connection with the accompanying drawings wherein:

Fig. 1 is a vertical section through my improved engine and

Fig. 2 is a section taken on line 2—2 of Fig. 1.

Although in the following description I refer to my invention and describe it as a radial engine it will be understood that my inventive features may be embodied in a pump, motor or other device.

Referring to the drawings by reference characters I have indicated my improved engine generally at 10. As shown this engine includes a housing 12 in which a plurality of radially disposed cylinders 13 are positioned. The cylinders 13 are shown as 9 in number but it will be understood that more or less may be provided as desired.

The engine 10 includes a drive shaft 14 and within each of the cylinders 13 there is provided a piston 15, each of which with one exception has pivotally secured thereto as at 16 a connecting rod 17 which in turn is pivotally secured as at 18 to a ring member 19. The one piston referred to is pivotally secured as at 20 to an arm 21 which is rigidly secured to the ring 19 or is integral therewith as shown.

Secured on the drive shaft 14 as by a drive fit I provide a ball bearing member 24 which is positioned in a groove 25 in the ring member 19. Secured to the drive shaft 14 intermediate its length as by a key 26 I provide an arm 27 which has a shaft 28 mounted adjacent one end thereof. The shaft has a rotatable roller 29 mounted thereon. This roller 29 is positioned in the groove 25 in which the ball bearing member 24 is arranged to move. Adjacent the end of the arm 27 opposite the roller 29 I preferably provide a counter weight portion 30.

The fuel and ignition systems and the valve mechanism may be of any desired type and it is not believed necessary to illustrate and describe the same.

In operation when the Number 1 cylinder fires as shown in Fig. 1 the connecting rod 17 thereof pushes the ring member 19 downward and to one side which movement causes the arm 27 to move in a clockwise direction, thereby rotating the drive shaft 14. Before the Number 1 cylinder has reached the limit of its firing stroke the Number 3 cylinder fires and so on around all the odd numbered cylinders, thus every other cylinder fires until one complete revolution of the drive shaft is made. After this occurs the even numbered cylinders fire during one revolution of the drive shaft and then the operation is repeated.

From the foregoing description it will be seen that I have invented a radial prime mover which is highly efficient.

I claim:

1. In a rotary mechanism having a drive shaft, a ring member positioned around said shaft, a member on said shaft, a portion of said shaft engaging said last-mentioned member, an arm secured to said shaft, a rotatable member supported on said arm adjacent one end thereof, said rotatable member engaging said ring member opposite said shaft member and means to move said ring member about an axis eccentric to said shaft.

2. In a rotary mechanism having a drive shaft, a ring member positioned around said shaft, a member on said shaft, a portion of said shaft member engaging said ring member, an arm secured to said shaft, a rotatable member supported on said arm adjacent one end thereof, said rotatable member engaging said ring opposite said shaft member, and

means to eccentrically oscillate said ring member.

3. In a mechanical movement having a drive shaft, a ring member positioned around said shaft, an antifriction member on said shaft, a groove on the inner surface of said ring member, a portion of said antifriction member being positioned in said ring groove, an arm, said arm being secured intermediate its length to said shaft, a roller rotatably supported on said arm adjacent one end thereof, said roller being positioned in said ring groove opposite to said antifriction member, a counterweight member on said arm adjacent the end thereof opposite said roller, and means to oscillate said ring member to thereby rotate said arm and to rotate said drive shaft.

4. In an engine having a drive shaft, a plurality of cylinders radially positioned around said drive shaft, a piston in each of said cylinders, a ring member positioned around said shaft, said pistons each having one end of a connecting rod pivotally secured thereto with the opposite ends of said connecting rods pivotally secured to said ring member, a member mounted on said shaft, and movably engaging said ring member, an arm secured to said shaft, a rotatable member supported on said arm adjacent one end thereof, said rotatable member movably engaging said ring opposite said shaft member, said pistons when actuated being adapted to oscillate said ring member to thereby move said arm to thereby rotate said drive shaft.

5. In an engine having a housing, a drive shaft, a plurality of cylinders on said housing radially positioned around said drive shaft, a piston in each of said cylinders, a ring member positioned around said shaft, a connecting arm rigidly secured to said ring and pivotally secured to one of said pistons, the other of said pistons each having one end of a connecting rod pivotally secured thereto with the opposite end of each connecting rod pivotally secured to said ring member, an antifriction member on said shaft, a groove on the inner surface of said ring member, a portion of said antifriction member positioned in said ring groove, an arm, said arm being secured to said shaft intermediate its length, a roller rotatably supported on said arm adjacent an end thereof, said roller being positioned in said ring groove opposite said antifriction member, a counterweight member on said arm adjacent the end thereof opposite said roller, said pistons when actuated being adapted to oscillate said ring member to thereby move said arm and said arm being adapted to rotate said drive shaft.

6. In an engine having a drive shaft, a plurality of cylinders radially positioned around said drive shaft, a piston in each of said cylinders, a ring member positioned around said shaft, a member rotatable on said shaft and engaging the interior of said ring member, an arm member secured to and rotatable with said shaft, means on said arm member engaging the interior of said ring member whereby said arm member is given movement by said ring member and means whereby said pistons drive said ring member.

7. In an engine having a drive shaft, a plurality of cylinders radially positioned around said drive shaft, a piston in each of said cylinders, a ring member positioned around said shaft, means connecting said pistons and said ring member, means supporting said ring member whereby when said pistons operate said ring member is oscillated, and means movable around the surface of said ring member and rigid with said shaft to cause said shaft to rotate.

In testimony whereof, I hereunto affix my signature.

JACOB B. GROH.