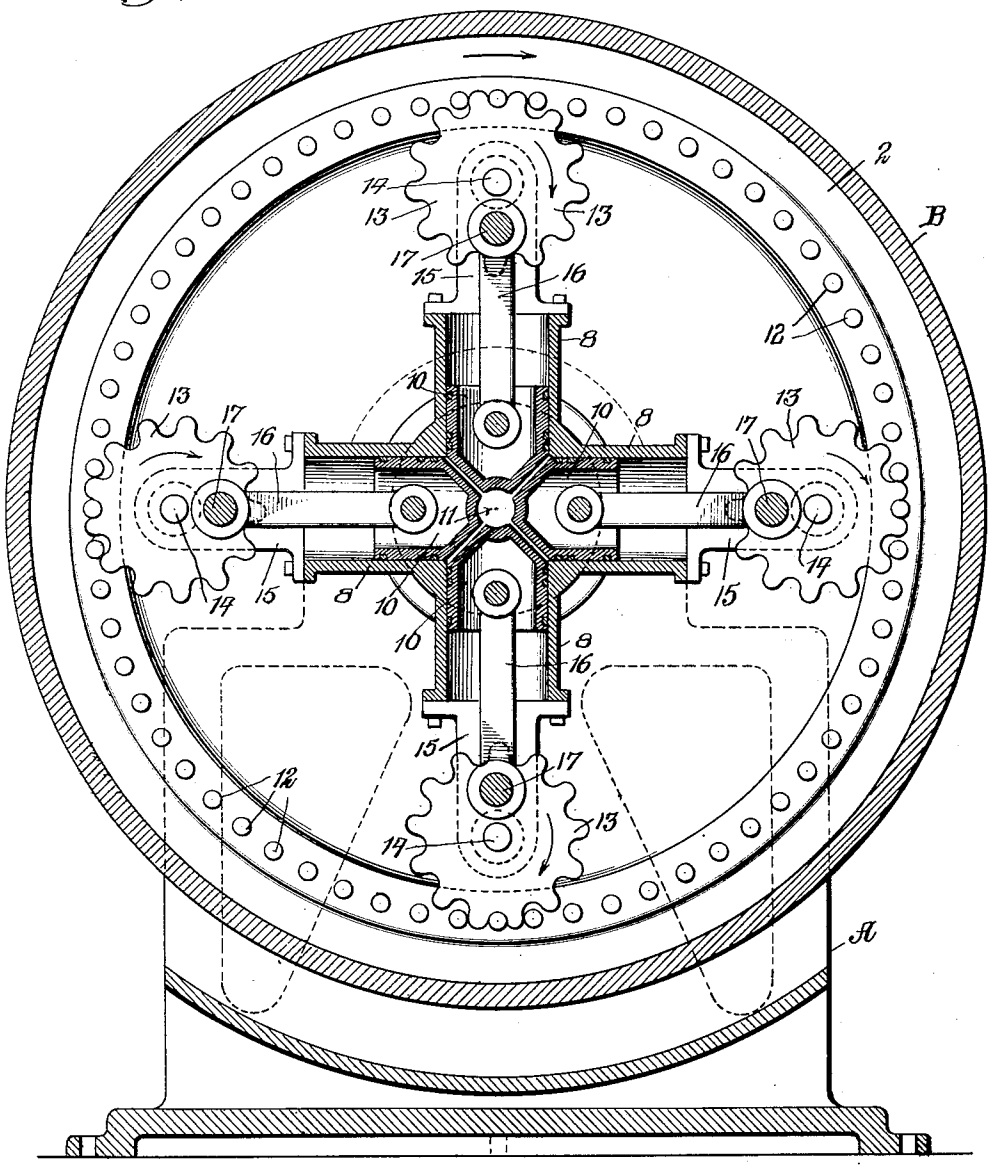
April 28, 1931. F. M. DAINTON 1,802,881

INTERNAL COMBUSTION ENGINE

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Fig. 1.



WITNESSES

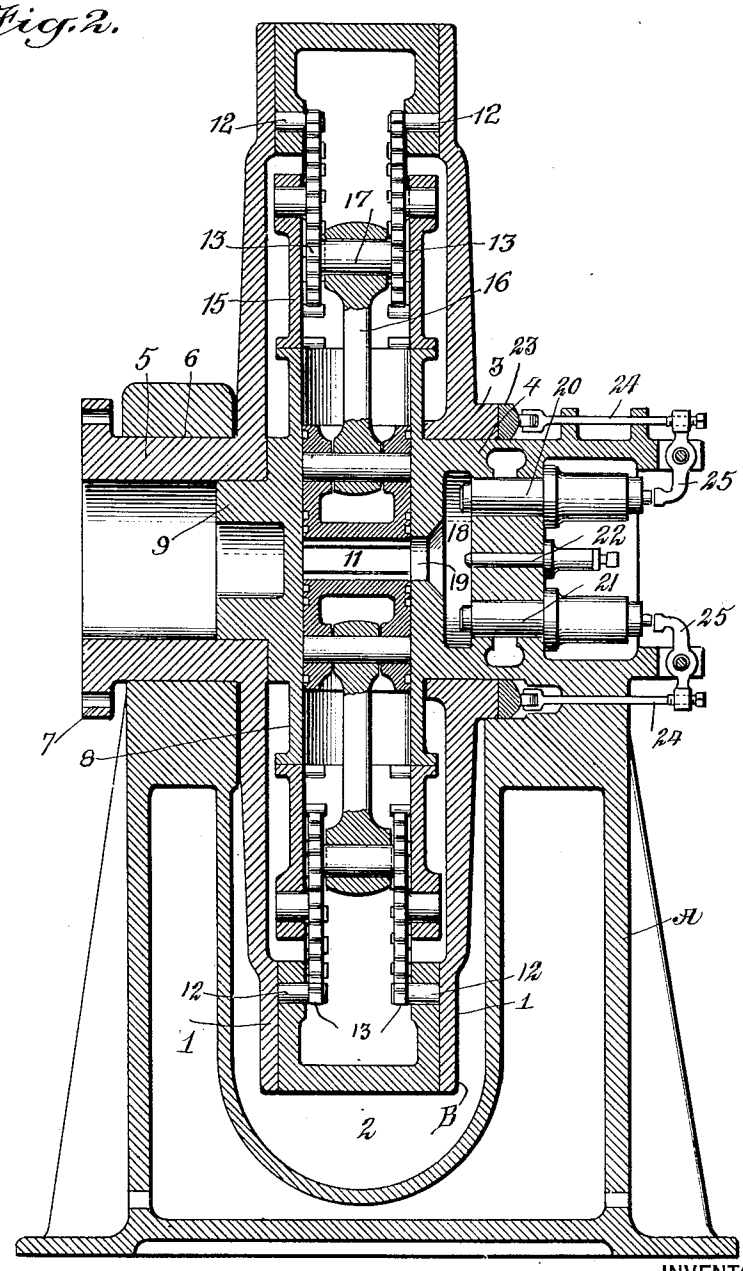
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Fig. 2.



WITNESSES

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UNITED STATES PATENT OFFICE

FRANCIS M. DAINTON, OF NEW YORK, N. Y.

INTERNAL-COMBUSTION ENGINE

Application filed November 1, 1928. Serial No. 316,556.

This invention relates to internal combustion engines.

The primary object of the invention is to provide an engine of this character in which a plurality of stationary cylinders are employed having a common explosive chamber with which the pistons in the respective cylinders communicate, so that a single explosion imparts power strokes to the several pistons and rotary motion is transformed from the reciprocating motion of the pistons to turn a circular member from which power may be taken off either from the periphery thereof or from the center.

My invention embodies many novel features of construction and arrangement of parts, some of which may be enumerated as follows:

Improved means for transmitting motion from the working pistons to the cylindrical rotary member.

Dispensing altogether with the need of crank shafts or eccentric drives of any description.

Providing a reduction self-balancing internal combustion engine.

Dispensing with the necessity for fly wheels or the like.

Providing an engine in which power may be taken off from the periphery of the directly driven cylindrical rotary member or from a hub at the center thereof.

Providing means in which the maximum of power is utilized with a minimum of fuel consumption and power transmitted at a plurality of different points simultaneously to the cylindrical rotary member.

With these and other objects in view, the invention consists in certain novel features of construction and combinations and arrangements of parts which will be more fully hereinafter described and pointed out in the claims.

In the accompanying drawings—

Figure 1 is a view in longitudinal section through my improved engine;

Figure 2 is a view in vertical transverse section through the center of the engine shown in Figure 1.

A represents a supporting base on which a hollow cylindrical member B has rotary mounting. This member B may be referred to as a rotor and it comprises spaced disks 1, 1 connected by a circular channel-shaped ring 2, the side flanges of which are secured to the disks 1 in any approved manner. In any event the disks and ring 2 turn as a single rotor.

One of the disks 1 has a short upper section 3 mounted to turn on a cylindrical block 4 fixed to or integral with the base A. The other disk 1 has a cylindrical hub 5 mounted to turn in a bearing 6 in the base A, and having a clutch member 7 or other device thereon from which power may be taken.

Within the rotor B a plurality of cylinders 8 are located. I have shown four of these cylinders, the several cylinders at right angles to each other and all having communication with each other at the inner ends of the cylinders.

These cylinders 8 may constitute a single block fixed to or integral with the block 4 and having a journal 9 on one side opposite the block 4 which projects into the hub 5 and functions to maintain the parts in proper relationship to each other.

A working piston 10 is located in each cylinder 8 and these working pistons are preferably tapered at their inner ends so that they gradually reduce in diameter and at their inner extremities are preferably curved so that when they are at the inner ends of their strokes, as indicated in Figure 1, an explosion chamber 11 is provided formed by the several pistons.

The inwardly projecting flanges of the ring 2 are provided with pins 12, which form two circular racks, and these pins are engaged by pinions 13 mounted on short shafts 14 carried by brackets 15 extending from and rigidly secured to the ends of the cylinders 8.

Connecting rods 16 are pivotally connected to the working pistons 10 and to crank pins 17 which connect the pairs of pinions 13. These pinions 13 preferably have rounded teeth to engage the racks formed by the pins 12 although of course

the invention is not limited to the shape of the pinion teeth nor to the particular manner of forming the racks nor to other structural details which are obviously capable of modification.

The block 4 above referred to has a chamber 18 therein which communicates with the chamber or space 11 through the medium of a port 19. The outer wall of the chamber 18 is illustrated as provided with an air inlet valve 20, an exhaust valve 21 and a jet nozzle 22, these parts being employed when the engine is functioning as a Diesel type of engine. It is obvious of course that the invention is capable of use in connection with any type of internal combustion engine and with slight modification may be utilized as a two or four-cycle engine although in the present drawing and description a four-cycle engine is set forth.

The hub 3 may carry a cam ring 23 which operates plungers 24 controlling the movement of levers 25 to properly time the operation of the air inlet valve 20 and exhaust valve 21.

The operation is as follows:

In the drawings, the working pistons 10 are shown in their improved positions, which we will assume is the beginning of the power strokes. The charge is exploded or burned in the chamber or space 11 between the several pistons and as it expands it forces all four of the pistons outwardly and through the medium of the connecting rods 16, pinions 13 and pin racks 12 imparts rotary motion to the rotor B. The momentum of the rotor causes the pistons to move inwardly on their scavenging or exhaust strokes, then outwardly on the intake strokes and then inwardly on the compression strokes.

With an engine of this character I am enabled to impart direct power at a number of different points on a rotor. This power is equalized in its distribution and maximum efficiency is had.

As above stated, power may be taken directly from the periphery of the rotor or it may be taken from the hub of the motor or it may be taken from both for varying speeds so that my engine is in effect a rotary engine to the extent at least that its driving element constitutes a rotor within the area of which reciprocating engine elements function with maximum efficiency.

Various changes and alterations might be made in the general form of the parts described without departing from my invention and hence I do not limit myself to the precise details set forth but consider myself at liberty to make such changes and alterations as fairly fall within the spirit and scope of the appended claim.

I claim:

An internal combustion engine, comprising four cylinders at right angles to each other, communicating at their inner ends, working pistons in the cylinders having tapering inner ends and adapted when in their inward position to provide an explosion and compression space whereby the power of the burning mixture is imparted alike to all four pistons, brackets on the ends of the cyinders, pairs of pinions mounted to turn on said brackets, connecting rods connecting the pistons with the crank pins, the latter connecting pairs of pinions, a circular driven member, and racks in the driven member engaged by the pinions, said racks providing pins projecting inwardly and between which the teeth of the pinions mesh.

FRANCIS M. DAINTON.