June 30, 1925.

1,544,382

V. ENTLER

COMBUSTION MOTOR

Filed Nov. 28, 1922

2 Sheets-Sheet 1

Fig. 1.

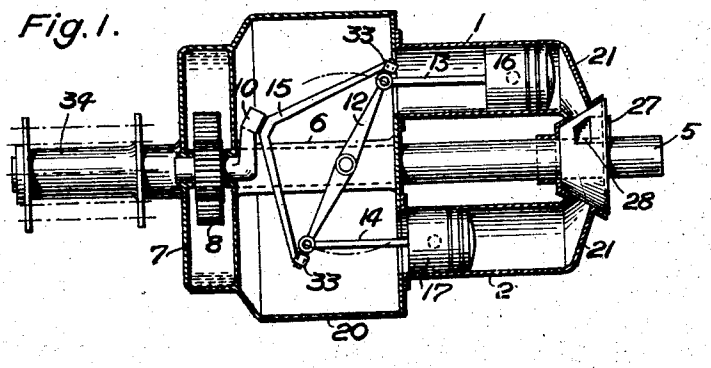


Fig. 2.

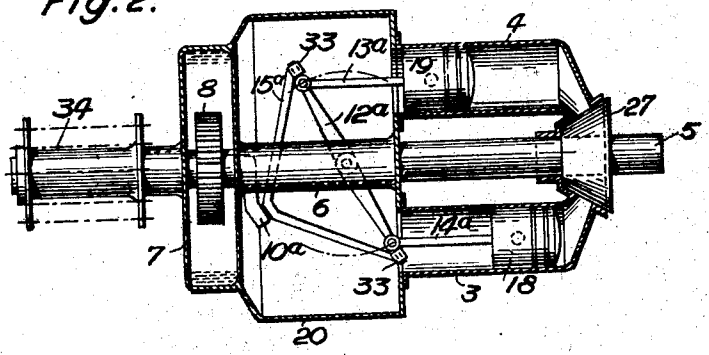
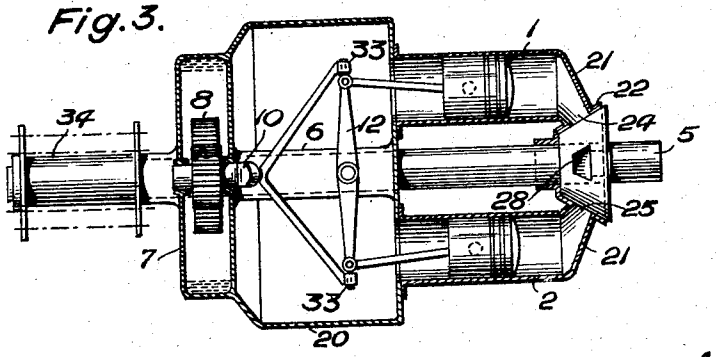


Fig. 3.



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June 30, 1925. 1,544,382

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Filed Nov. 28, 1922 2 Sheets-Sheet 2

Fig.4.

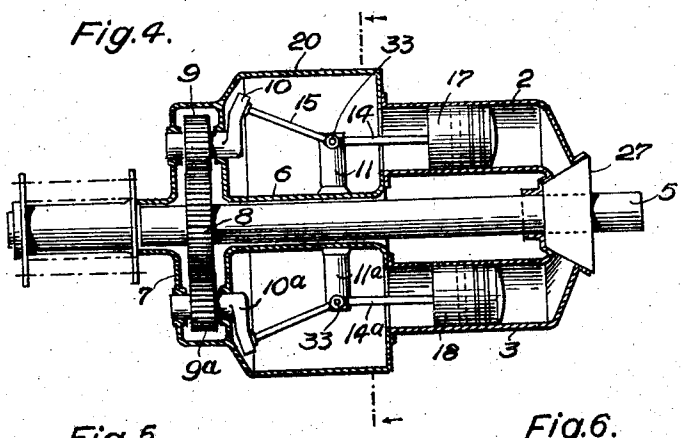


Fig.5.

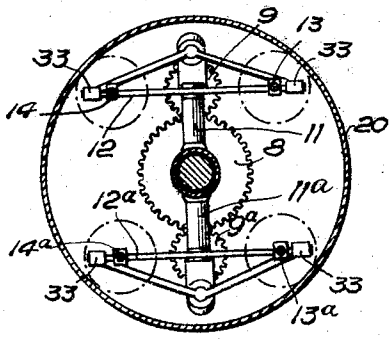


Fig.6.

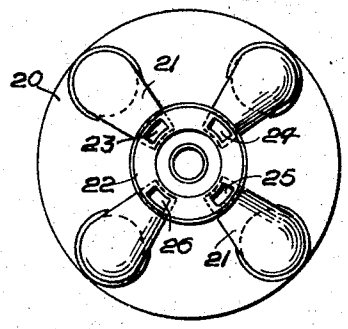


Fig.7.

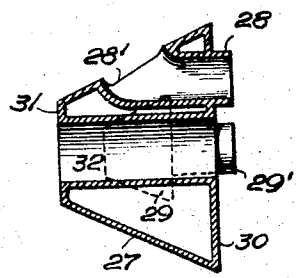
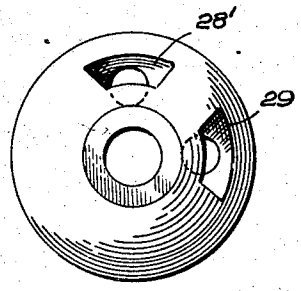


Fig.8.



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Patented June 30, 1925. 1,544,382

UNITED STATES PATENT OFFICE.

VIKTOR ENTLER, OF BREMEN, GERMANY.

COMBUSTION MOTOR.

Application filed November 28, 1922. Serial No. 603,846.

To all whom it may concern:

Be it known that I, VIKTOR ENTLER, a citizen of Italy, residing at Bremen, Germany, Herdentorsteinweg 42, have invented certain new and useful Improvements in Combustion Motors, of which the following is a specification, reference being had therein to the accompanying drawings.

My present invention relates to certain novel and useful improvements in the structure of such a motor and has for one of its objects to provide a structure relatively simple by which the known four periods are obtained, when the cylinders are turned one time about the axis of the motor.

A further object of my invention is to bring out a construction with a full compensation of the masses being in movement.

In obtaining this result I use a construction in which the cylinders are arranged parallelly to the axis of the motor. This arrangement is known per se, however I use in a new manner special means by which the movement of the pistons in the cylinders is transformed into the rotating movement of the motor, a characteristic feature of my invention being the fact, that two pistons operate to drive by a body similar to a triangle a crank and that the rotating parts make only half the turns of the cranks entering fresh gases to cool the steering device.

With the above objects in view the invention consists in the construction, combination and arrangement of parts hereinafter fully described claimed and illustrated in the accompanying drawing, wherein Fig. 1 is a top view, the illustration being made partly in section in order to show the upper pair of cylinders, Fig. 2 is a similar view different parts being omitted to show the under pair of cylinders, Fig. 3 is a similar view as that of Fig. 1, the pistons being all in their middle position, Fig. 4 is a side elevation partly in section showing likewise all pistons in middle position, Fig. 5 shows a front elevation of the crank gearing, Fig. 6 a front elevation taken from the right hand end, a part of the steering device being removed, Fig. 7 is an axial section of that part removed in the illustration of Fig. 6 and Fig. 8 is a front elevation of the part illustrated in Fig. 7.

On a stationary axle 5 is rotatably mounted a hollow shaft 6. Rigidly connected to this hollow shaft are a casing 7 and four cylinders 1, 2, 3, and 4. The casing 7 is therefore rotatably mounted on the axle 5. A protecting wall 20 is arranged to surround the space between the casing and the cylinders.

In the casing 7 two wheels 9 and 9^a are mounted in such a way, that they engage a gear wheel 8, which is rigidly connected to the axle 5. The gear wheels 9 and 9^a are diametrically opposed to each other and have half the diameter of the gear wheel 8.

Rigidly connected to the hollow shaft 6 and arranged radially to the axis of the said shaft are two studs 11 and 11^a. Journalled on these studs are two traverses or double armed levers 12 and 12^a. Rotatably connected to the ends 33 of each of the levers 12, 12^a, are two rods 13 and 14 resp., 13^a and 14^a. The said rods 13, 14, 13^a, 14^a have their other ends journalled on pistons 16, 17, 18 and 19.

The extreme ends of the levers 12 and 12^a form pivots for two V-shaped parts 15 and 15^a. The middle point of the V forms the pivot for two cranks 10 and 10^a, which are rigidly connected to the gear wheels 9 and 9^a. The casing forms the support for the hub 34 of the propeller.

The motor operates in the following manner:

Viewing Figure 1, assume that piston 16 has just completed its compression stroke and that ignition is occurring so that the piston will be driven to the left. The pressure exerted by the explosion on the piston is transmitted by the rod 13 to the double-armed lever 12 and over the V-shaped part 15 to the crank 10. This latter is thereby rotated and the rotation transmitted to the gear wheel 9, which rolling over the stationary wheel 8 transfers the rotating movement to the casing. This rotation is transferred by the hollow shaft 6 to the cylinders 1, 2, 3, 4.

The Fig. 2 shows the position of the pistons and of the cranks in the same moment, for which Fig. 1 shows the position of the cylinders 1 and 2.

Therefore the pistons, after a half rotation of the cylinders have finished a double stroke.

The explosion chamber of each cylinder is connected by a single channel 21, through which the gas enters and the consumed gases are expelled, to a conical body 22, the geometrical axis of which is coincident with that of the axle 5. Into this conical body

is fitted gastight a hollow body 27, fixed to the axle 5.

This hollow body 27 is closed in the neighborhood of the axle 5 by a tube 32 (Fig. 7), at the left hand end by a ring bottom 31 and at the right hand end by a ring bottom 30. Into the bottom 30 are inserted two tubes 29′ and 28. The tube 29′ forms an inlet for the incoming gases which extend through the inner room of the body 27 and may escape through an opening 29, whereas the consumed gases may escape through an opening 28′ and tube 28 into the atmosphere. The body 27 and tube 28 are cooled by the entering fresh gases.

When the body 22 rotates, the four periods of suction, compression, explosion and exhaust are obtained during one rotation, each channel 21 contacting firstly the quadrant of the body 27 with the opening 29 two unperforated quadrants and finally the opening 28′.

It may be understood, that while I have herein described my present device in more or less detail, it may in certain instances be found desirable to modify the construction, f. i. the number of cylinders may be altered furthermore the conical steering device may be substituted by a cylindrical one without leaving the spirit of my invention. I therefore reserve the privilege of resorting to all such legitimate changes or modifications therein as may be fairly embodied within the spirit and scope of the invention as claimed.

I claim:

1. An internal combustion engine comprising a number of cylinders having their axes extending substantially parallel with a common center about which the cylinders are annularly disposed, pistons in said cylinders, connecting rods coupled to said pistons, levers having their outer ends connected to pairs of the pistons operating in alternate relation, a shaft, pins on the shaft for supporting the intermediate portions of the levers for pivotal movement, V-shaped parts having the free ends thereof pivoted upon the end portions of the levers, cranks coupled to the intermediate portions of the V parts, pinions turned by said cranks and a fixed gear wheel over which said pinions are adapted to roll.

2. An internal combustion engine comprising a shaft, cylinders arranged about said shaft with their axes substantially parallel with the axis of the shaft, pistons reciprocating in said cylinders, connecting rods coupled to the pistons, levers fulcrumed to rock intermediately upon said shaft and to turn with the shaft, said levers being coupled at their outer ends to pairs of the connecting rods of alternately operating pistons, a fixed gear wheel having the same center with the shaft, pinions arranged to roll about said gear wheel, cranks connected to turn said pinions, and V-shaped parts having their intermediate angled ends coupled to said cranks and with their free end portions pivotally engaging the opposite ends of said levers near the point of connection of said connecting rods.

In testimony that I claim the foregoing as my invention, I have signed my name in presence of two subscribing witnesses.

VIKTOR ENTLER.

Witnesses:
WILHELM THURMANN,
JOSEF MAIR.