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Bassett

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[54] **TANGENTIAL DRIVEN ROTARY ENGINE**

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[51] **Int. Cl.**[6] **F02B 75/06**

[52] **U.S. Cl.** **123/56.2**; 123/56.7

[58] **Field of Search** 123/56.1, 56.2, 123/56.7

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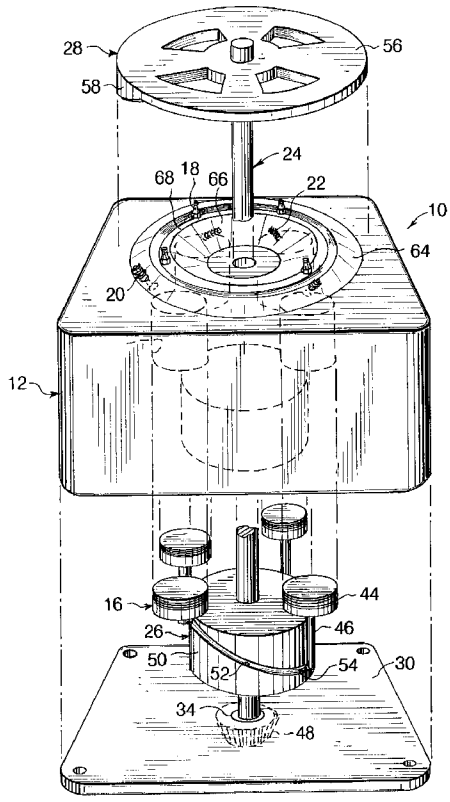
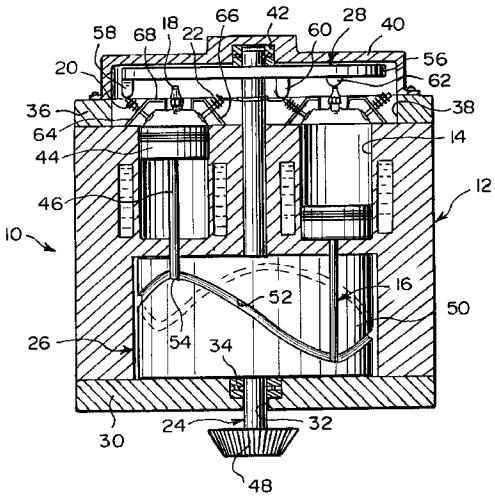
[57] **ABSTRACT**

A tangential driven rotary engine (**10**) comprising an engine block (**12**) having a plurality of cylinder combustion chambers (**14**) radially positioned therein. A plurality of pistons (**16**) are each movable and disposed within each cylinder combustion chamber (**14**) in the engine block (**12**). A plurality of spark plugs (**18**) are each radially positioned on the engine block (**12**) to extend into one cylinder combustion chamber (**14**). A plurality of intake valves (**20**) are each radially positioned on the engine block (**12**) to extend into one cylinder combustion chamber (**14**). A plurality of exhaust valves (**22**) are each radially positioned on the engine block (**12**) to extend into one cylinder combustion chamber (**14**). A main motor shaft (**24**) extends centrally through the engine block (**12**) with the cylinder combustion chambers (**14**) and the pistons (**16**) radially positioned thereabout. A facility (**26**) is for changing the reciprocating motion of the pistons (**16**) into a rotary motion for the main motor shaft (**24**). A component **28** on the main motor shaft (**24**) is for operating each of the spark plugs (**18**), each of the intake valves (**20**) and each of the exhaust valves (**22**) in timed intervals.

14 Claims, 5 Drawing Sheets





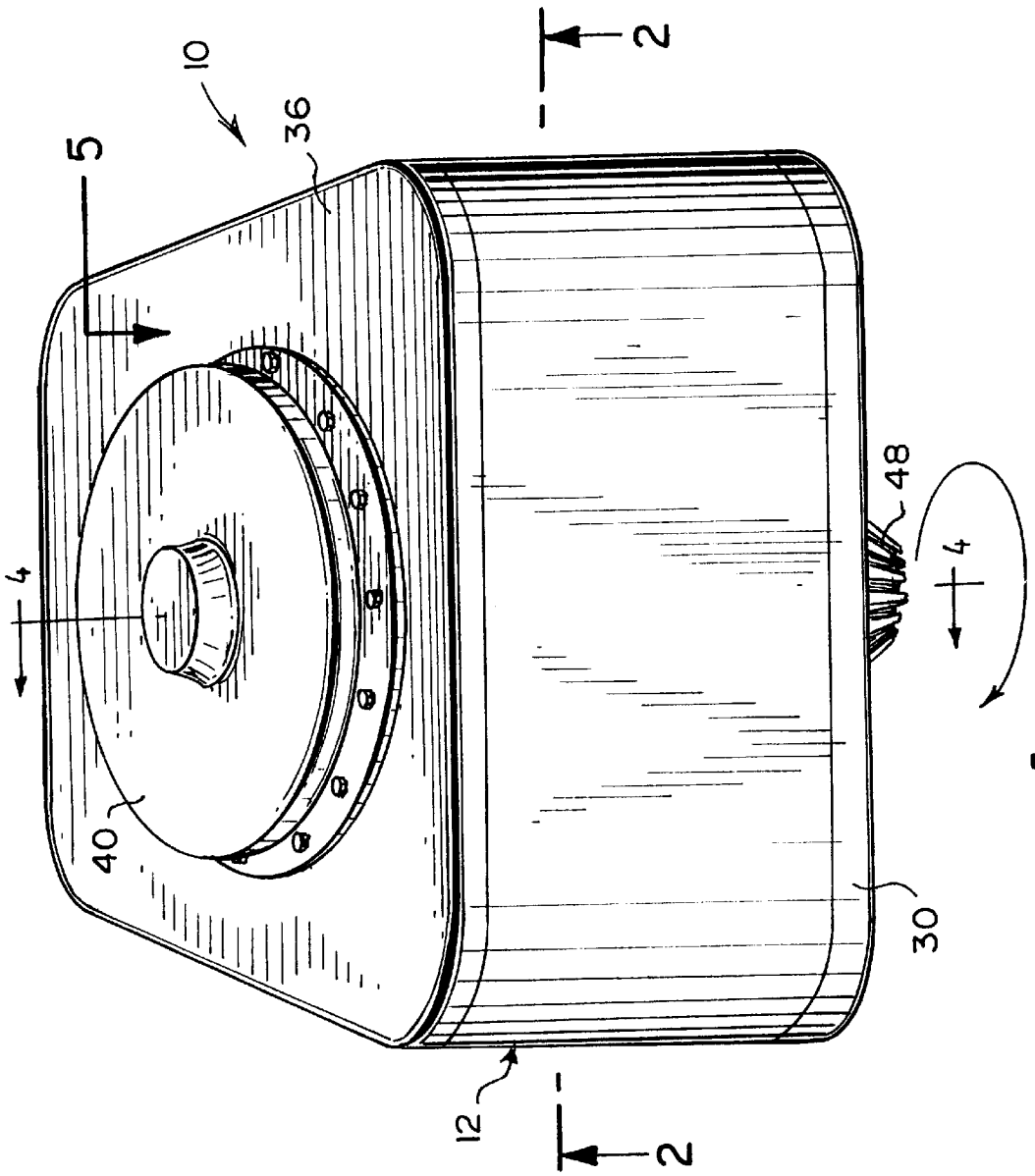


Fig. 1

Fig. 2

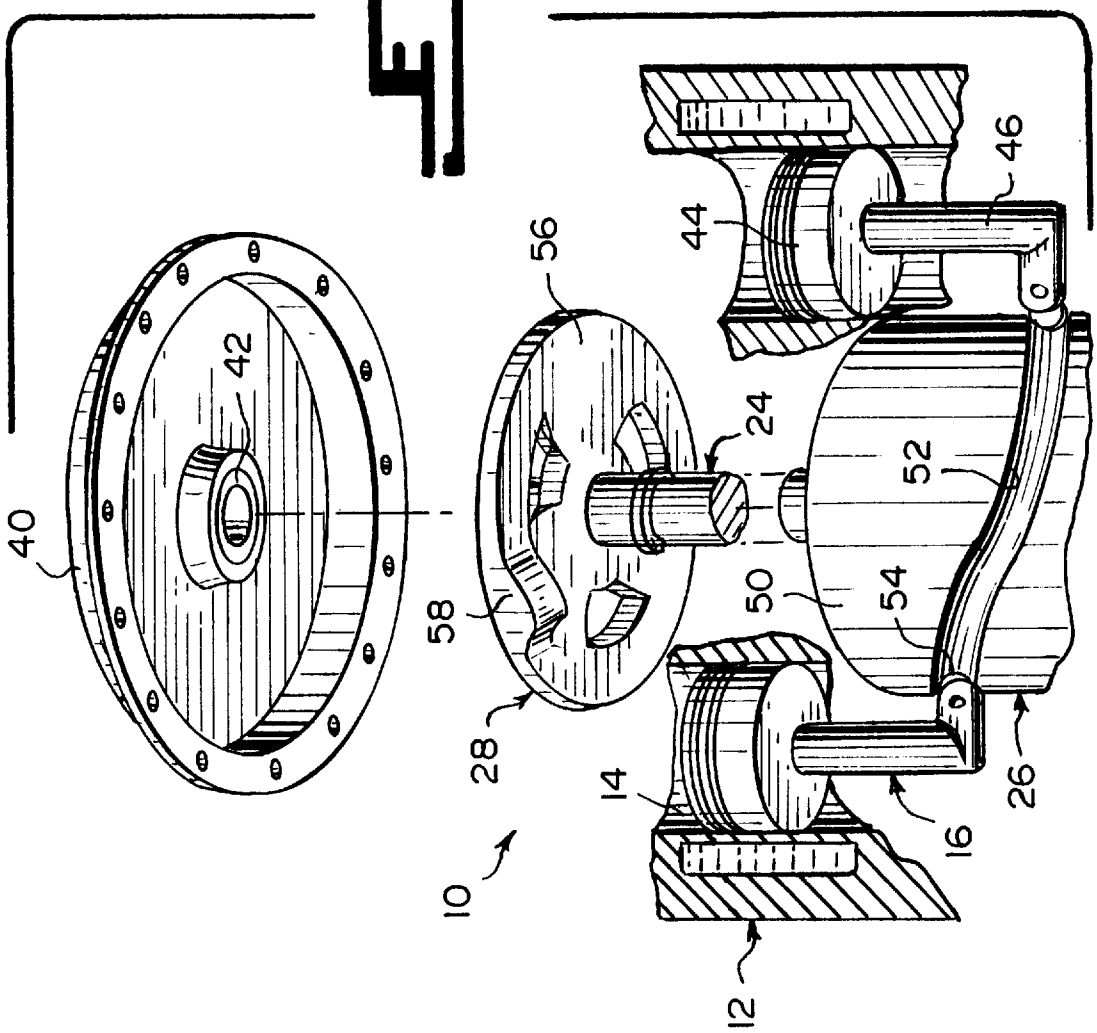
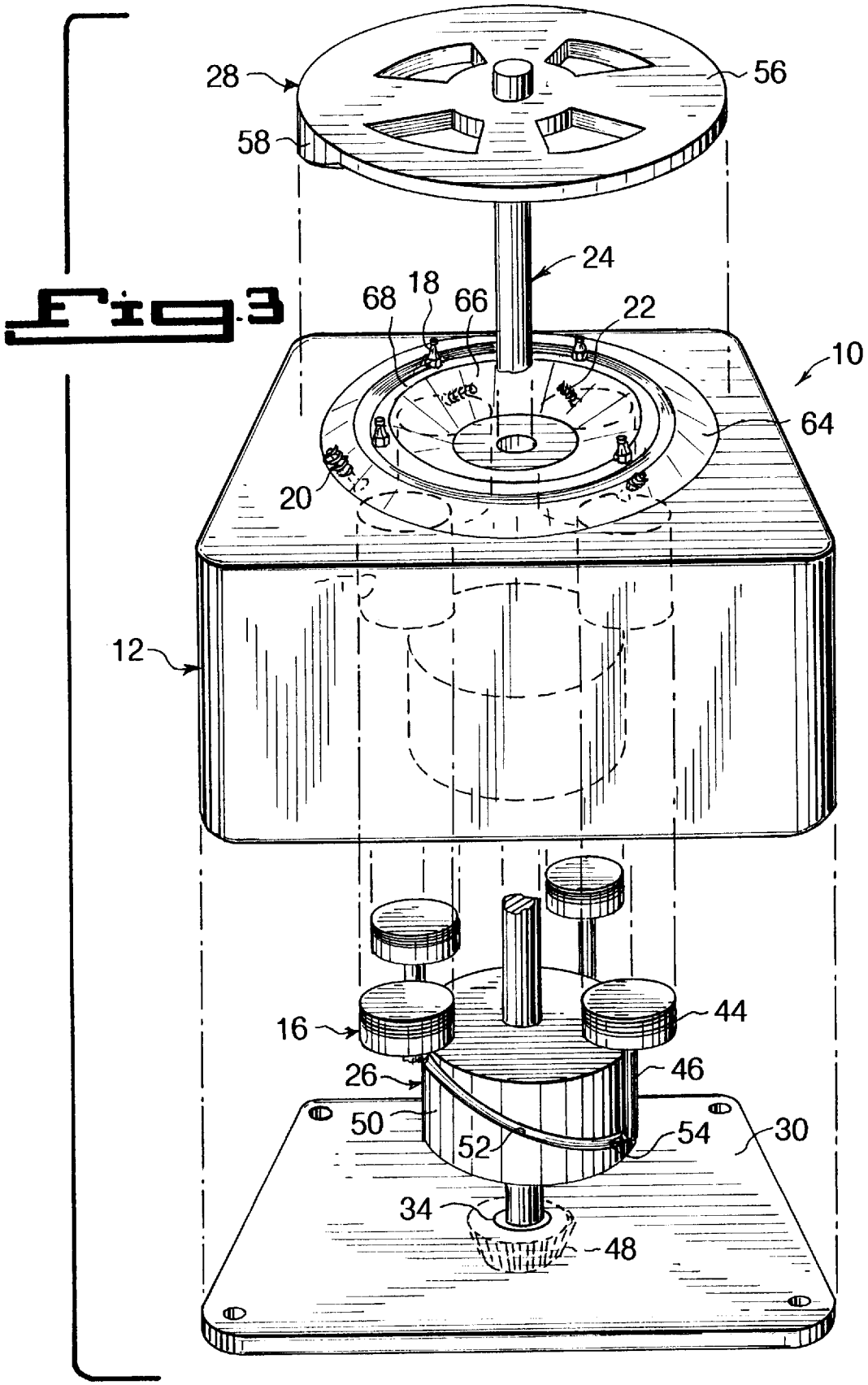


Fig.3



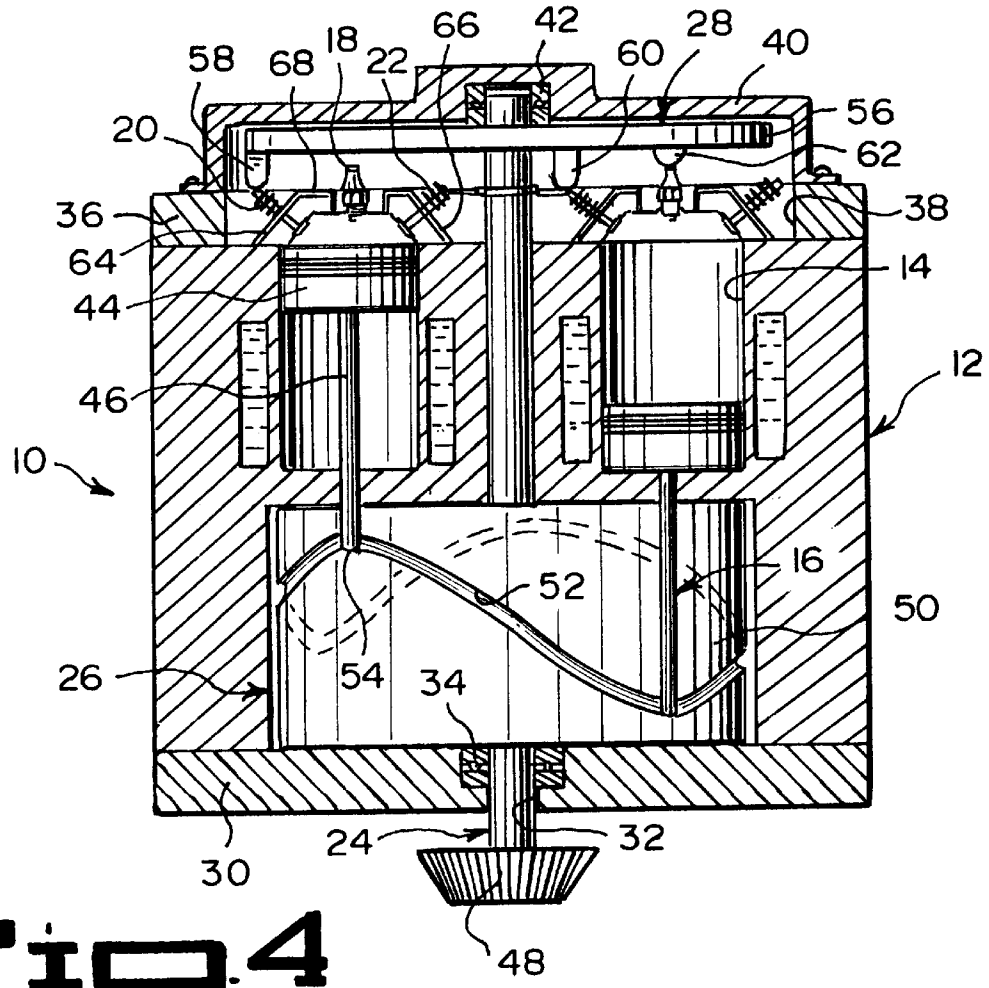

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Fig. 4

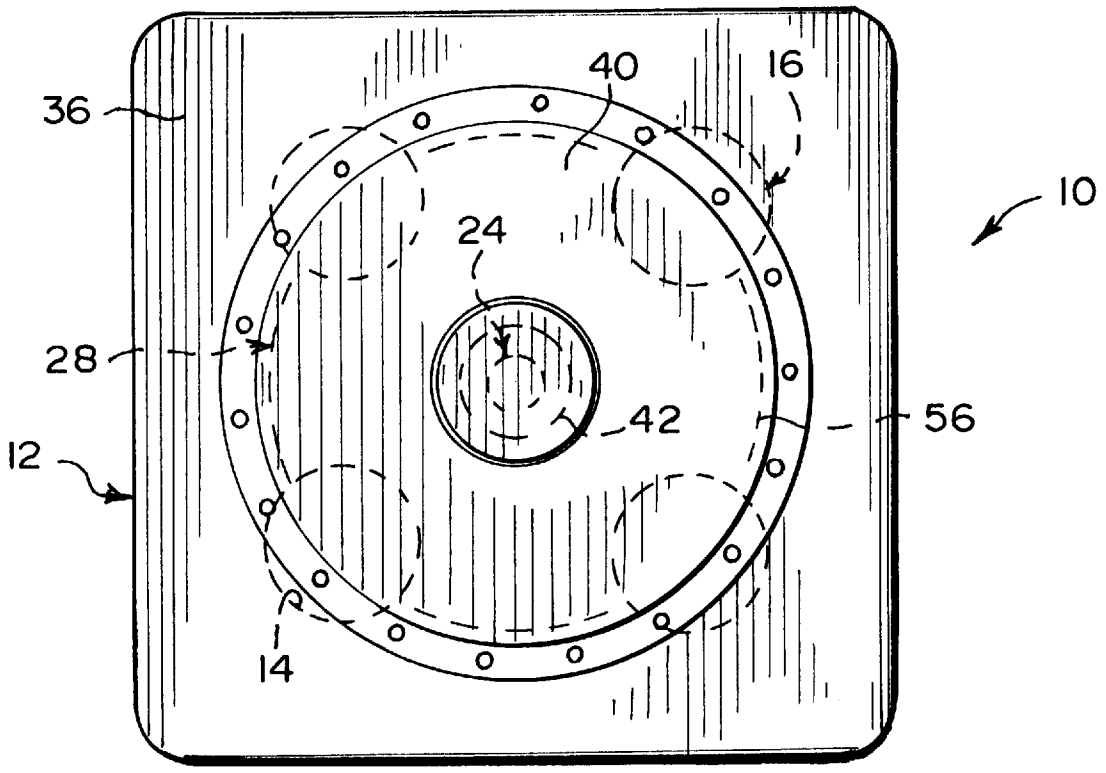

Fig. 5

TANGENTIAL DRIVEN ROTARY ENGINE

BACKGROUND OF THE INVENTION

1. Field of the Invention

The instant invention relates generally to internal combustion engines and more specifically it relates to a tangential driven rotary engine. The tangential driven rotary engine combines the best features of a piston engine with the best features of a rotary engine, so as to better operate a motor vehicle.

The first successful rotary engine was developed in 1956 by Felix Wankel of West Germany. The pistons are replaced by a three-cornered rotor that turns in an oval housing, providing three separate combustion chambers. The engine is lighter than a comparable piston engine, but difficulties with rotating seals are possible, fuel efficiency is poorer, and pollution problems are more likely.

2. Description of the Prior Art

Numerous internal combustion engines have been provided in prior art that are adapted to burn fuel within enclosed spaces to move pistons in cylinders and turn crankshafts, so as to operate motor vehicles which will travel along roads. While these units may be suitable for the particular purpose to which they address, they would not be as suitable for the purposes of the present invention as heretofore described.

SUMMARY OF THE INVENTION

A primary object of the present invention is to provide a tangential driven rotary engine that will overcome the shortcomings of the prior art devices.

Another object is to provide a tangential driven rotary engine that has less movable parts with less friction loss, so consequently the engine is more efficient, in which it produces increased revolutions per minute and additional horsepower.

An additional object is to provide a tangential driven rotary engine that is more compact, so it weighs less than a conventional engine, and it can be turned up more quickly since there is no chain or belt to adjust, allowing a more accurate timing to increase its efficiency.

A further object is to provide a tangential driven rotary engine that is simple and easy to use.

A still further object is to provide a tangential driven rotary engine that is economical in cost to manufacture.

Further objects of the invention will appear as the description proceeds.

To the accomplishment of the above and related objects, this invention may be embodied in the form illustrated in the accompanying drawings, attention being called to the fact, however, that the drawings are illustrative only, and that changes may be made in the specific construction illustrated and described within the scope of the appended claims.

BRIEF DESCRIPTION OF THE DRAWING FIGURES

Various other objects, features and attendant advantages of the present invention will become more fully appreciated as the same becomes better understood when considered in conjunction with the accompanying drawings, in which like reference characters designate the same or similar parts throughout the several views, and wherein;

FIG. **1** is a top perspective view of the instant invention assembled.

FIG. **2** is a partial bottom perspective cross sectional view with parts broken away, taken along line **2**—**2** in FIG. **1**.

FIG. **3** is a top perspective view of the instant invention with parts removed, exploded and broken away.

FIG. **4** is a cross sectional view taken along line **4**—**4** in FIG. **1**.

FIG. **5** is a top view taken in the direction of arrow **5** in FIG. **1**.

Similar reference characters denote corresponding features consistently throughout the attached drawings.

DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENTS

Turning now descriptively to the drawings, in which similar reference characters denote similar elements throughout the several views, FIGS. **1** to **5** illustrate a tangential driven rotary engine **10** comprising an engine block **12** having a plurality of cylinder combustion chambers **14** radially positioned therein. A plurality of pistons **16** are each movable and disposed within each cylinder combustion chamber **14** in the engine block **12**. A plurality of spark plugs **18** are each radially positioned on the engine block **12**, to extend into one cylinder combustion chamber **14**. A plurality of intake valves **20** are each radially positioned on the engine block **12**, to extend into one cylinder combustion chamber **14**. A plurality of exhaust valves **22** are each radially positioned on the engine block **12**, to extend into one cylinder combustion chamber **14**.

A main motor shaft **24** extends centrally through the engine block **12** with the cylinder combustion chamber **14** and the pistons **16** radially positioned thereabout. A facility **26** is for changing the reciprocating motion of the pistons **16** into a rotary motion for the main motor shaft **24**. A component **28** on the main motor shaft **24** is for operating each of the spark plugs **18**, each of the intake valves **20** and each of the exhaust valves **22** in timed intervals.

The engine block **12** includes a bottom cover **30** having a central aperture **32** therethrough. A bottom bearing **34** is located at the central aperture **32** in the bottom cover **30**, for the main motor shaft **24** to extend through. A top cover **36** has a large central opening **38** therethrough. A cap **40** is affixed to the top cover **36** over the large central opening **38**, so as to enclose the spark plugs **28**, the intake valves **20**, the exhaust valves **22** and the operating component **28** therein. A top bearing **42** is located centrally with the cap **40**, for the main motor shaft **24** to rotatively engage with.

Each piston **16** consists of a piston head **44** and a stud **46** affixed to and extending downwardly from the piston head **44**. A bevel gear **48** on a bottom end of the main motor shaft **24** extends outwardly from a bottom end of the engine block **12**. The bevel gear **48** can engage with another bevel gear on a horizontal drive shaft (not shown).

The motion changing facility **26** comprises the main motor shaft **24** having an enlarged cylindrical member **50** with a sinuous curved track **52** thereon. Each piston stud **46** has a bearing roller **54** on a distal lower end, which rides within the sinuous curved track **52** in the enlarged cylindrical member **50** on the main motor shaft **24**. When the pistons **16** move up and down during operation thereof, the bearing rollers **54** in the sinuous curved track **52** will cause the enlarged cylindrical member **50** to rotate the main motor shaft **24** within the engine block **12**.

The operating component **28** consists of a disc member **56** affixed centrally to a top end of the main motor shaft **24**. A first cam **58** on the disc member **56** depresses each intake

valve **20** in the timed intervals, when the disc member **56** rotates with the main motor shaft **24**. A second cam **60** on the disc member **56** depresses each exhaust valve **22** in the timed intervals, when the disc member **56** rotates with the main motor shaft **24**. An electric contact **62** on the disc member **56** engages each spark plug **18** in the timed intervals, when the disc member **56** rotates with the main motor shaft **24**.

An outer torus member **64** is on the engine block **12** within the large central opening **38** in the top cover **36**. All of the intake valves **20** are mounted in the outer torus member **64**. An inner torus member **66** is on the engine block **12** within the large central opening **38** in the top cover **36**. All of the exhaust valves **22** are mounted in the inner torus member **66**. A ring member **68** is on the engine block **12** between the outer torus member **64** and the inner torus member **66** on the engine block **12**, within the large central opening **38** in the top cover **36**. All of the spark plugs **18** are mounted in the ring member **68**.

The sinuous curved track **52** is in a continuous serpentine pattern about the enlarged cylindrical member **50** on the main motor shaft **24**. The continuous serpentine pattern has a plurality of peaks and a plurality of valleys, wherein each peak follows a valley in sequence thereabout. The carburetor, lubrication, cooling and starting systems are not shown in the drawings, since they are all conventional. The enlarged cylindrical member **50** can be hollow with the sinuous curved track **52** placed on the inside. The pistons **16** can now be radially arrange closer to the main motor shaft **24** within the engine block **12**.

It will be understood that each of the elements described above, or two or more together may also find a useful application in other types of methods differing from the type described above.

While certain novel features of this invention have been shown and described are pointed out in the annexed claims, it is not intended to be limited to the details above, since it will be understood that various omissions, modifications, substitutions and changes in the forms and details of the device illustrated and in its operation can be made by those skilled in the art without departing in any way from the spirit of the present invention.

Without further analysis, the foregoing will so fully reveal the gist of the present invention that others can, by applying current knowledge, readily adapt it for various applications without omitting features that, from the standpoint of prior art, fairly constitute essential characteristics of the generic or specific aspects of this invention.

What is claimed is new and desired to be protected by Letter Patent is set forth in the appended claims:

1. A tangential driven rotary engine comprising:

a) an engine block having a plurality of cylinder combustion chambers radially positioned therein;

b) a plurality of pistons, each movable and disposed within each said cylinder combustion chamber in said engine block;

c) a plurality of spark plugs, each radially positioned on said engine block to extend into one cylinder combustion chamber;

d) a plurality of intake valves, each radially positioned on said engine block to extend into one cylinder combustion chamber;

e) a plurality of exhaust valves, each radially positioned on said engine block to extend into one said cylinder combustion chamber;

f) a main motor shaft extending centrally through said engine block with said cylinder combustion chambers and said pistons radially positioned thereabout;

g) means for changing the reciprocating motion of said pistons into a rotary motion for said main motor shaft; and

h) means on said main motor shaft for operating each of said spark plugs, each of said intake valves and each of said exhaust valves in timed intervals, wherein said engine block includes:

i) a bottom cover having a central aperture therethrough;

ii) a bottom bearing located at said central aperture in said bottom cover for said main motor shaft to extend through;

iii) a top cover having a large central opening therethrough;

iv) a cap affixed to said top cover over said large central opening so as to enclose said spark plugs, said intake valves, said exhaust valves and said operating means therein; and

v) a top bearing located centrally with said cap for said main motor shaft to rotatively engage with, and

said tangential driven rotary engine further includes an outer torus member on said engine block within said large central opening in said top cover, in which all of said intake valves are mounted in said outer torus member.

2. A tangential driven rotary engine as recited in claim **1**, wherein each said piston includes:

a) a piston head; and

b) a stud affixed to and extending downwardly from said piston head.

3. A tangential driven rotary engine as recited in claim **1**, further comprising a bevel gear on a bottom end of said main motor shaft extending outwardly from a bottom end of said engine block, so that said bevel gear can engage with another bevel gear on a horizontal drive shaft.

4. A tangential driven rotary engine as recited in claim **1**, wherein said motion changing means includes:

a) said main motor shaft having an enlarged cylindrical member with a sinuous curved track thereon; and

b) each said piston stud having a bearing roller on a distal lower end, which rides within said sinuous curved track in said enlarged cylindrical member on said main motor shaft, so that when said pistons move up and down during operation thereof, said bearing rollers in said sinuous curved track will cause said enlarged cylindrical member to rotate said main motor shaft within said engine block.

5. A tangential driven rotary engine as recited in claim **4**, wherein said sinuous curved track is in a continuous serpentine pattern about said enlarged cylindrical member on said main motor shaft, wherein said continuous serpentine pattern has a plurality of peaks and a plurality of valleys, wherein each said peak follows a valley in sequence thereabout.

6. A tangential driven rotary engine as recited in claim **1**, wherein said operating means includes:

a) a disc member affixed centrally to a top end of said main motor shaft;

b) a first cam on said disc member to depress each said intake valve in the timed intervals, when said disc member rotates with said main motor shaft;

c) a second cam on said disc member to depress each said exhaust valve n the timed intervals, when said disc member rotates with said main motor shaft; and

d) an electric contact on said disc member to engage each said spark plug in the timed intervals, when said disc member rotates with said main motor shaft.

7. A tangential driven rotary engine as recited in claim **1**, further including an inner torus member on said engine block within said large central opening in said top cover, in which all of said exhaust valves are mounted in said inner torus member.

8. A tangential driven rotary engine as recited in claim **7**, further including a ring member on said engine block between said outer torus member and said inner torus member on said engine block within said large central opening in said top cover, in which all of said spark plugs are mounted in said ring member.

9. A tangential driven rotary engine as recited in claim **1**, further comprising a bevel gear on a bottom end of said main motor shaft extending outwardly from a bottom end of said engine block, so that said bevel gear can engage with another bevel gear on a horizontal drive shaft.

10. A tangential driven rotary engine as recited in claim **9**, wherein said motion changing means includes:

a) said main motor shaft having an enlarged cylindrical member with a sinuous curved track thereon; and

b) each said piston stud having a bearing roller on a distal lower end, which rides within said sinuous curved track in said enlarged cylindrical member on said main motor shaft, so that when said pistons move up and down during operation thereof, said bearing rollers in said sinuous curved track will cause said enlarged cylindrical member to rotate said main motor shaft within said engine block.

11. A tangential driven rotary engine as recited in claim **10**, wherein said operating means includes:

a) a disc member affixed centrally to a top end of said main motor shaft;

b) a first cam on said disc member to depress each said intake valve in the timed intervals, when said disc member rotates with said main motor shaft;

c) a second cam on said disc member to depress each said exhaust valve n the timed intervals, when said disc member rotates with said main motor shaft; and

d) an electric contact on said disc member to engage each said spark plug in the timed intervals, when said disc member rotates with said main motor shaft.

12. A tangential driven rotary engine as recited in claim **11**, further including an inner torus member on said engine block within said large central opening in said top cover, in which all of said exhaust valves are mounted in said inner torus member.

13. A tangential driven rotary engine as recited in claim **12**, further including a ring member on said engine block between said outer torus member and said inner torus member on said engine block within said large central opening in said top cover, in which all of said spark plugs are mounted in said ring member.

14. A tangential driven rotary engine as recited in claim **13**, wherein said sinuous curved track is in a continuous serpentine pattern about said enlarged cylindrical member on said main motor shaft, wherein said continuous serpentine pattern has a plurality of peaks and a plurality of valleys, wherein each said peak follows a valley in sequence thereabout.

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