H. L. F. TREBERT.

INTERNAL COMBUSTION ENGINE.

APPLICATION FILED OCT. 18, 1911.

1,215,434.

Patented Feb. 13, 1917.

5 SHEETS—SHEET 1.

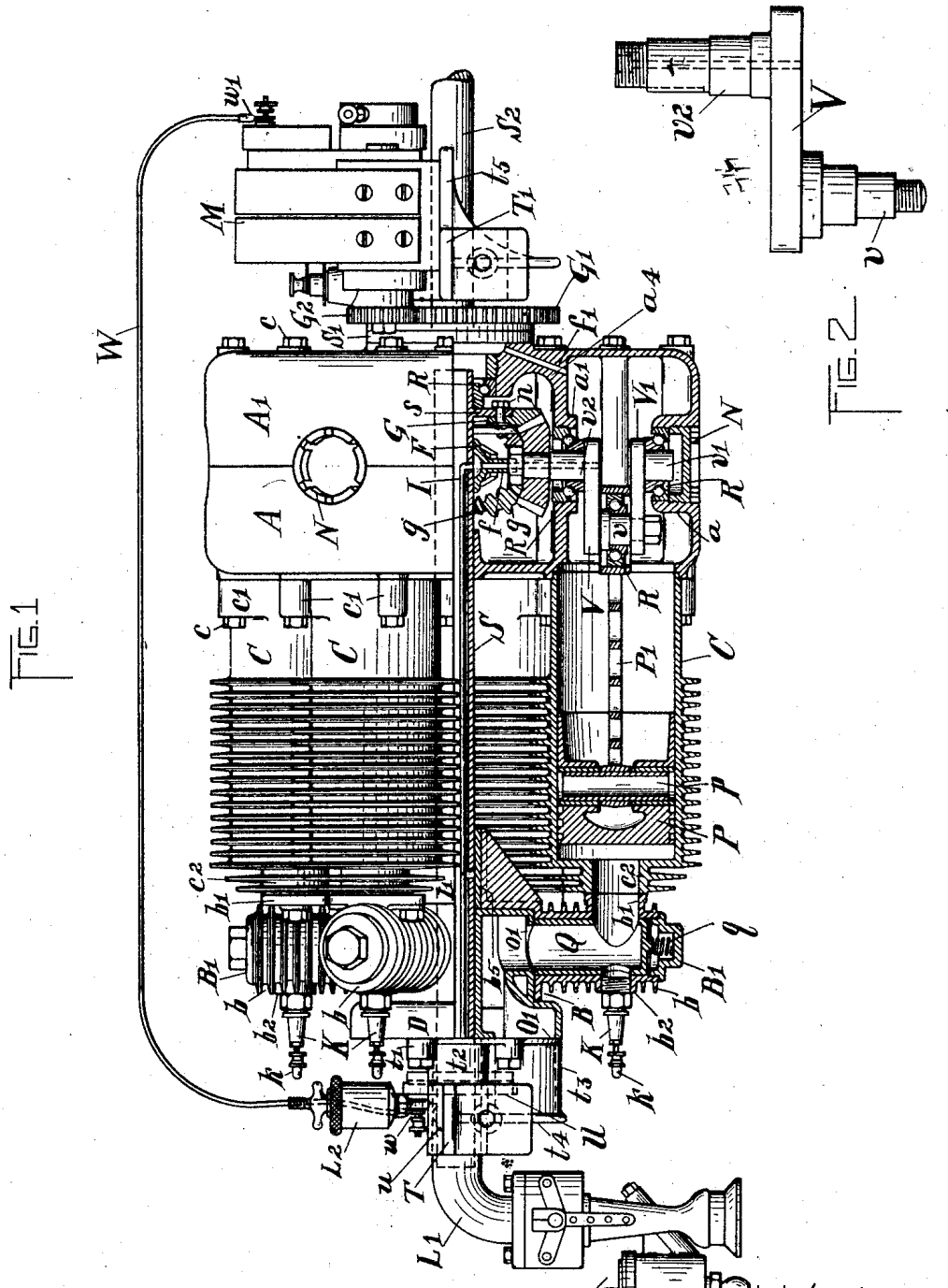


FIG. 1

FIG. 2

WITNESSES:

Marshall Nelson

Osborne F. Gurney

INVENTOR:

Henry L. F. Trebert

BY Wm. K. Cooley ATTY.

H. L. F. TREBERT.

INTERNAL COMBUSTION ENGINE.

APPLICATION FILED OCT. 18, 1911.

1,215,434.

Patented Feb. 13, 1917.

5 SHEETS—SHEET 2.

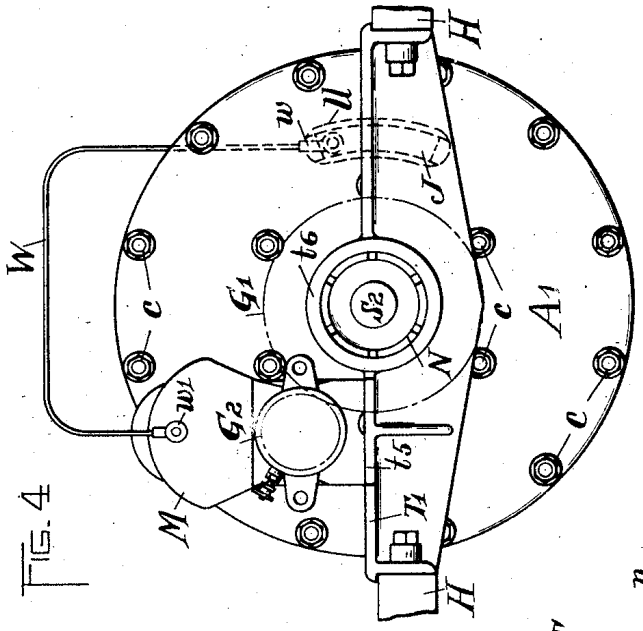


FIG. 4

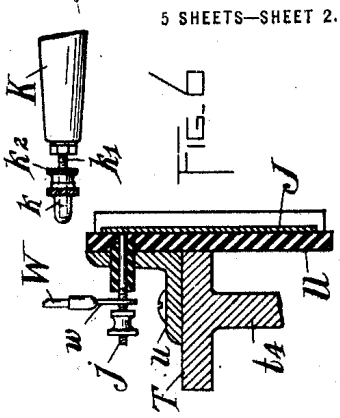


FIG. 6

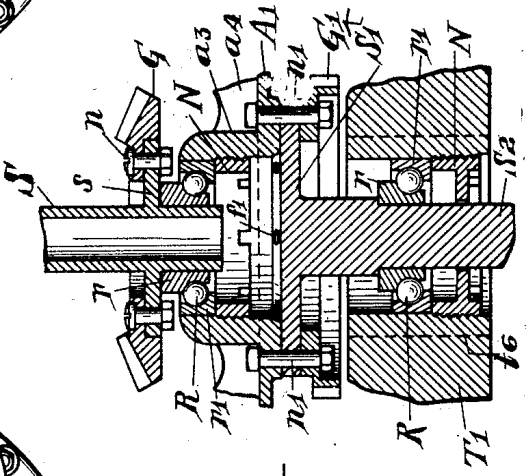


FIG. 5

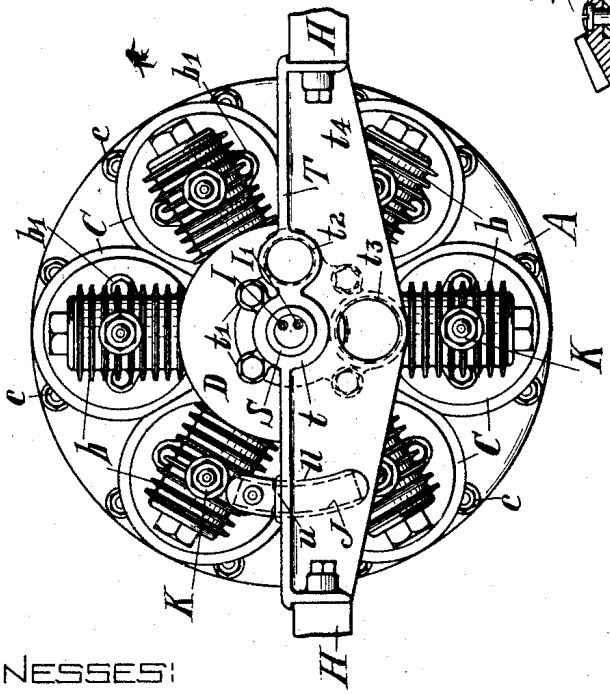


FIG. 3

WITNESSES:

Martha M. Nelson

Osborne F. Gurney

INVENTOR:

Henry L. F. Trebert

BY Wm. H. Cooley ATTY

H. L. F. TREBERT.

INTERNAL COMBUSTION ENGINE.

APPLICATION FILED OCT. 18, 1911.

1,215,434.

Patented Feb. 13, 1917.

5 SHEETS—SHEET 3.

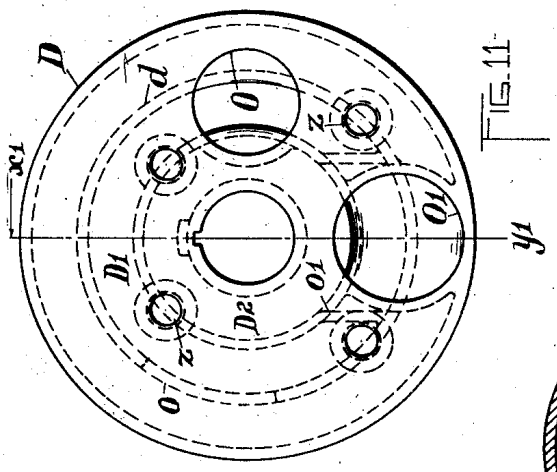


FIG. 11

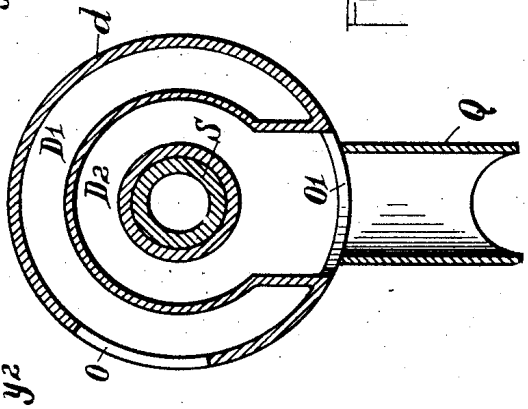


FIG. 12

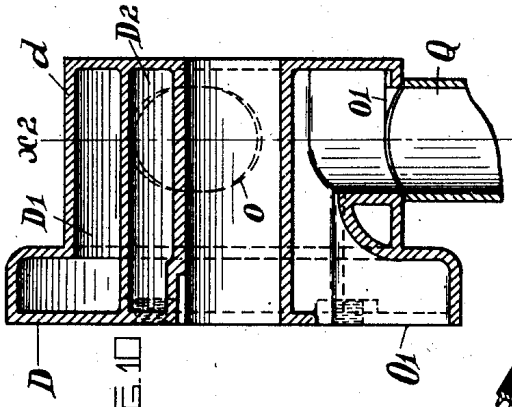


FIG. 10

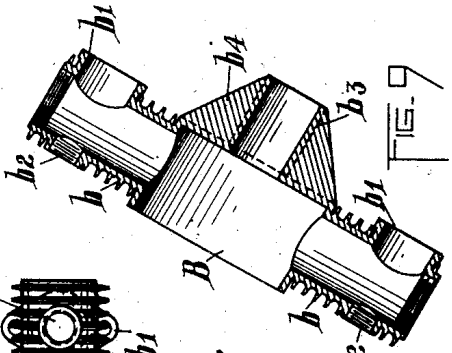


FIG. 9

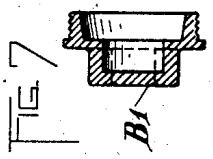


FIG. 7

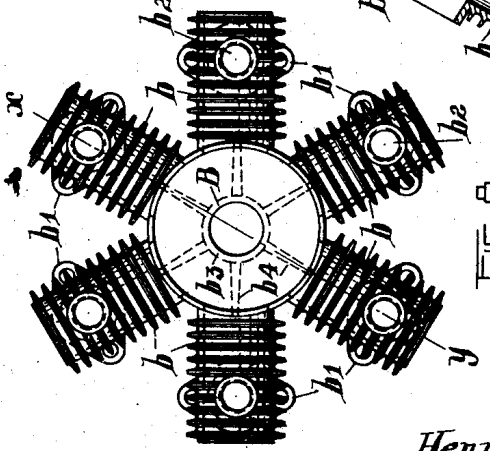


FIG. 8

WITNESSES:

Marchall Nelson

Osborne J. Gurney

INVENTOR:

Henry L. F. Trebert

BY Wm. H. Cooley ATTY.

H. L. F. TREBERT.

INTERNAL COMBUSTION ENGINE.

APPLICATION FILED OCT. 18, 1911.

1,215,434.

Patented Feb. 13, 1917.

5 SHEETS—SHEET 4.

FIG. 14

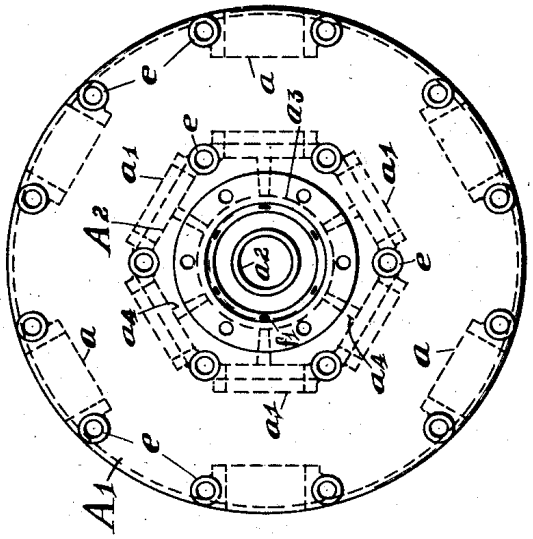


FIG. 16

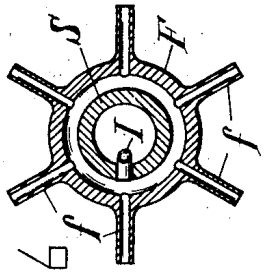


FIG. 13

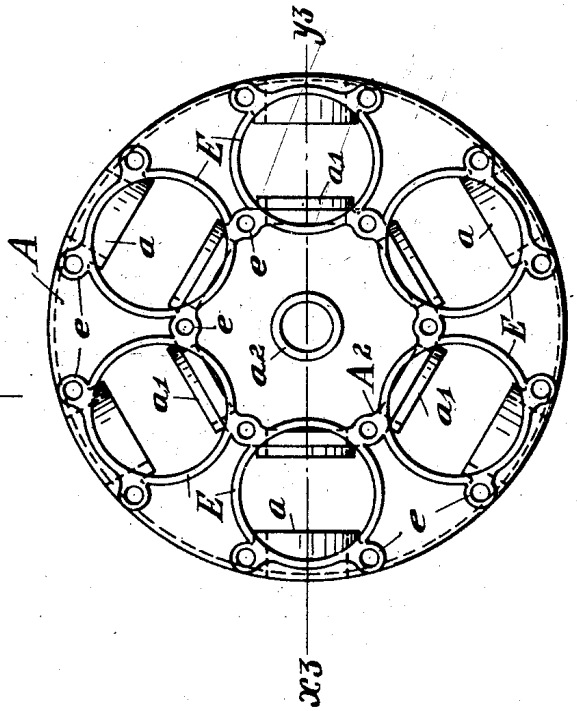
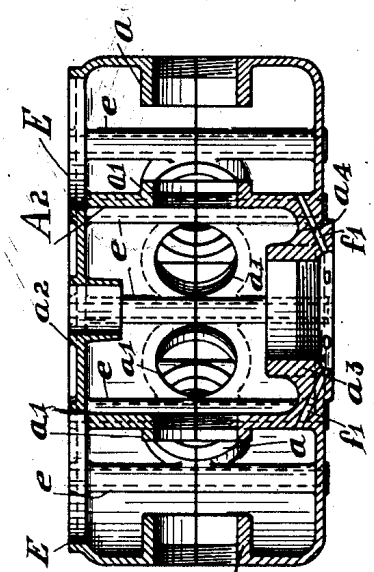


FIG. 15



WITNESSES:

Marshall Nelson

Osborne & Gurney

INVENTOR:

Henry L. F. Trebert

BY Wm. H. Cooley

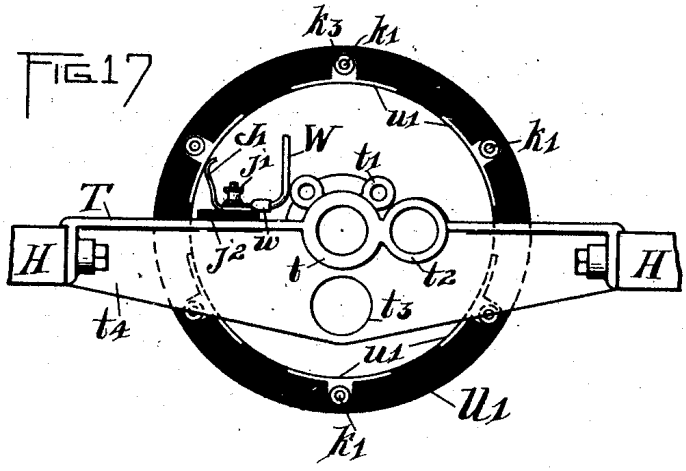
ATTY

H. L. F. TREBERT.
INTERNAL COMBUSTION ENGINE.
APPLICATION FILED OCT. 18, 1911.

1,215,434.

Patented Feb. 13, 1917.
5 SHEETS—SHEET 5.

FIG. 17



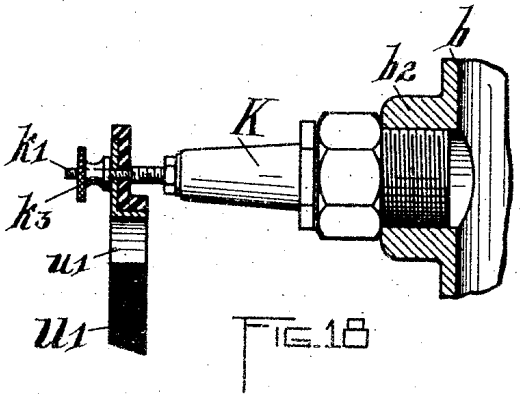


FIG. 18

WITNESSES:
Martha M. Nelson
Osborne F. Gurney

INVENTOR:
Henry L. F. Trebert
BY W. H. Cooley
ATTY.

UNITED STATES PATENT OFFICE.

HENRY L. F. TREBERT, OF ROCHESTER, NEW YORK, ASSIGNOR TO H. L. F. TREBERT ROTARY MOTOR CO., INC., OF ROCHESTER, NEW YORK, A CORPORATION OF NEW YORK.

INTERNAL-COMBUSTION ENGINE.

1,215,434. Specification of Letters Patent. Patented Feb. 13, 1917.

Application filed October 18, 1911. Serial No. 655,326.

To all whom it may concern:

Be it known that I, HENRY L. F. TREBERT, a citizen of the United States, and a resident of Rochester, in the county of Monroe and State of New York, have invented a new and Improved Internal-Combustion Engine, of which the following is a specification.

This invention relates to internal combustion engines of that class in which a plurality of units, each comprising a, preferably independent, cylinder with a piston working therein operatively connected to the load, are caused to rotate about a common relatively fixed axis.

The purpose of my invention is to provide an engine of the character described with a minimum number of moving and wearing parts together with a minimum weight for the entire structure.

In carrying out my invention I arrange a series of such cylinders with their axes parallel and equidistant from the axis of the engine, and at the closed end of each cylinder opposite the crank I provide a tubular connecting member and chamber therefor in which the tubular connecting member is preferably spring actuated in a radial direction inwardly against a common cylindrical member comprising two chambers connected with the ingress and egress pipes or passages and having intake and exhaust ports coöperating with the tubular connecting member leading to each cylinder to connect each such cylinder alternately to the source of supply and to the exhaust.

The cylinders are connected to a common crank case within which the crank shafts are revolubly supported, one for each cylinder. The crank shafts are of course radially disposed with regard to the axis of the engine, and each carries on the inner end a planet gear coöperating with a common fixed sun gear to effect the rotation of the crank case and the cylinders as a whole. The crank case and cylinders, thus comprising the balance wheel of the engine, are revolubly supported upon a fixed shaft which extends into a sleeve carried by the crank case, and the crank case is provided with an outwardly extending shaft which revolves in a fixed bearing and may have on the end thereof outside of the bearing means for transmitting rotation to the load to be driven.

The accompanying drawings illustrate an embodiment of my invention as applied to an internal combustion engine comprising six, so called, four cycle units coöperatively connected and so arranged that each unit completes its four cycles for one rotation of the engine, or one rotation of each such unit around the common axis.

The drawings are as follows,—

Figure 1 is a side elevation of the engine with one of the units below the central horizontal line shown in vertical longitudinal section.

Fig. 2 is a view of one of the crank shafts of one of such units.

Fig. 3 is an end view of the engine as seen from the left, with the intake and exhaust pipe and carbureter removed.

Fig. 4 is an end view of the engine as seen from the right and shows the gears, seen at the right hand end and outside of the crank case, only in their pitch lines.

Fig. 5 shows in an enlarged longitudinal sectional view the main central fixed or sun gear of the engine and the shaft upon which the same is secured together with the revolving member encircling the shaft and also the bearing for this revoluble member in the engine frame.

Fig. 6 is a sectional view of the contacting segment and the outer terminal of one of the spark plugs.

Fig. 7 is a central sectional view of one of the screw caps for the valve chambers.

Fig. 8 shows in end view as seen from the left, a series of integrally cast intake and exhaust chambers and their common connecting member B, while Fig. 9 is a sectional view thereof taken along the line x—y of Fig. 8.

Fig. 10 is a sectional view of the casing inclosing the exhaust and intake chambers taken along the line x^1—y^1 of Fig. 11 while Fig. 11 shows an end view similar to Fig. 3 of this chamber.

Fig. 12 shows the same case in a transverse sectional view taken along the line x^2—y^2 of Fig. 10. In Figs. 10 and 12 the connecting member for one of the units is shown in sectional view opposite the exhaust and in Fig. 12 the fixed shaft is also shown.

Figs. 13 and 14 are end views of the crank case removed from the engine and as seen from the left and right respectively in Fig. 1.

Fig. 15 is a transverse sectional view of the crank case taken along the line x^3—y^3

of Fig. 13 while Fig. 16 is a central transverse sectional view of the member for supplying oil to the several crank shafts.

Fig. 17 is an end view of a modified detail relating to the igniting mechanism and Fig. 18 is a side view of one of the spark plugs and shows the method of supporting the part U^1 from the series of spark plugs K.

In the accompanying drawings, to avoid the confusion which would result from lettering all the parts, I have referred to the ball bearings as R as including the races and balls and all the adjusting nuts as N, such parts being well known in the art I have preferred to designate them in this way, as above indicated, to avoid the confusion which would result from a multiplicity of letters.

Similar parts are designated by similar reference characters throughout the several figures of the drawings.

Referring to the drawings.

The frame for my engine comprises side pieces H to which the transverse end members T and T^1 are bolted. The member T has a flange or web t^4 extending downwardly therefrom and has cast integrally therewith the intake and exhaust connecting members t^2 and t^3 respectively, such openings adapted to aline in the assembled engine with the intake and exhaust openings O and O^1 as seen in Figs. 10 and 11. On this cross piece T there is also provided a bearing t for a stationary central element of the engine in the form of the hollow shaft S, which is rigidly secured therein and on this member T there are provided also bosses t^1 for receiving the bolts, four in number, by means of which the member T is secured to the rear or left hand end with respect to Fig. 1 of the cylindrical fuel head or case D containing the exhaust and intake chambers, the holes for such bolts being indicated at z. The inner face of the part T and the abutting face of the part D are of course properly fitted to make a tight joint.

The head D is enlarged at its left hand end to make connection with the exhaust opening in the part t^3 and the alined opening O^1 in the head D is connected with the inner annular chamber D^2 around which there is an outer annular chamber D^1, the opening to which is alined with the intake opening in the member t^2. The outer chamber D^1 opens radially outward through an intake port o while the inner chamber D^2 is extended through the outer chamber and opens outwardly therethrough and through an exhaust port o^1 in the outer peripheral wall d of the casing D, which is turned off on the outside to receive the inner ends of the correspondingly conformed bushings or tubular valve members Q, of which there are 6, one in each of the chambers of a plurality of valve casings b, extending radially through and outwardly from a common central supporting member B, on which there is formed a central hub b^3 bored out to receive a bushing b^5, on which to rotate on the shaft S, on which shaft the chamber D is keyed. The central chamber within the member B is bored out to receive the smaller cylindrical body portion d of the case D. The valve tubes or bushings Q are closed at their outer ends and spring actuated as seen in Fig. 1 by means of springs q seated in and adjustable by means of the screw caps B^1, and are thereby held in engagement against the wall d of the member D. Each member Q comprises a cylindrical tube open at its inner end and having at right angles with the bore thereof an opening through the side wall registering with the opening through the right angled extension b^1 to the corresponding chamber b and also another opening registering with the threaded opening b^2, directly opposite the extension b^1 for receiving the spark plug K. Strengthening webs b^4 are formed between the hub b^3 and the inner wall of the member B and the extensions b^1 have lugs or ears thereon through openings in which the members b^1 are bolted directly to the heads c^2 of the cylinders C, from which construction it results that for each complete rotation of the member B each valve tube or connecting member Q is brought opposite the intake port o for supplying the charge to the corresponding cylinder and then at approximately three quarters of a rotation thereafter is brought opposite the exhaust port o^1 for the discharge of the burnt gases from the cylinder.

Within each cylinder C there is seen substantially the usual piston head P with which there articulates upon a shaft member p the inner end of a connecting rod P^1, the outer end of which makes connection by means of a ball bearing R with a crank pin v on the crank V, connected in the usual way with the main shart v^2, and to each crank pin v there is bolted the outer end of a crank V^1 secured on the short shaft v^1.

The crank case members A and A^1 are provided on their outer end faces with bosses e which are extended axially through the crank case and bored out to receive the bolts e for holding such crank case members together and also for holding the cylinders in place. The left hand crank case member A is provided on its end face with circular bearing faces E trued off to receive the flanged ends of the cylinders C and the cylinders carry lugs e^1 properly alined with the bosses e and bored out to receive the bolts e extending therethrough. The combined crank case comprising the members A and A^1 has an inner wall A^2 through which a series of recessed openings a^1 are provided for receiving the ball bearings R for the crank shafts v^2 while a series of in-

ternally threaded and inwardly extending bosses a are formed, six in number, seen at regular intervals around the outer wall of the crank case for receiving the ball bearings R for the short shafts v^1 and the threaded caps N serve as adjusting means for these last named ball bearings in the manner clearly indicated in Fig. 1.

Each shaft v^2 has on its inner end a beveled planet gear g meshing with a beveled sun gear G secured by bolts n to a flange s which is formed preferably by weldless forging on the hollow shaft S and extending radially outward therefrom. The proportions of the gears g and G are such that two complete rotations of each planet gear g effect a complete revolution of the cylinders C and crank shaft V and the other parts comprising each individual unit of the engine around the fixed shaft S. Thus it will be seen that each unit comprises a four cycle unit.

The crank case member A is provided with an inwardly extending hub a^2 bored out to receive the shaft S while the member A^1 is provided with a similar and inwardly extending member a^3 which is bored out and threaded internally to receive a nut N as indicated more fully in Fig. 5 for adjusting the ball bearing R, comprising the ball races r and r^1, at the end of the shaft S serving to force such bearing against the collar s on the shaft S and serving also to keep the inner and otherwise free end of the shaft S in alinement. On the outer end of the right hand section A^1 of the crank case there is secured by bolts n^1 the disk S^1 forged integrally with which is seen the shaft S^2 having a shoulder thereon for receiving the ball race r coöperating with the race r^1 seated in the hub member t^6, on the cross piece T^1, and adjustable therein by means of the threaded collar N. This end piece T^1 has also, extending to the right therefrom, a bracket t^5 formed by an extension of the horizontally disposed web thereon, and to which there is secured the magneto M having on the armature shaft thereof a gear G^2 meshing in turn with the gear G^1 secured to the flange S^1 and to the member A^1 by means of bolts n^1, as seen in Fig. 5. One terminal of the magneto is grounded as usual in internal combustion engines and the other terminal w^1 is connected by means of the cable W with the contacting segment J, secured in the channel in the insulating member U upon the bracket u, screwed to the horizontally disposed flange on the end frame member T. Connection between the cable W and the contacting segment J is effected through the medium of the screw connection j and the thumb nut thereon, the cable having a connecting clip w adapted to slip over the threaded member j, which in turn is connected directly with the segment J. Each individual spark plug K carries an adjustable cap k on the outer end of the terminal k^1 adapted to pass within the channeled segment U and the usual adjusting means is provided to advance and retard the spark which, forming no part of my present invention, is omitted, and by the operation of which, however, ignition can be effected at any point in the period of time during which each spark-plug is passing the sparking segment J. The terminal caps k are held in proper adjustment by means of the lock nuts k^2.

Through the shaft S there extend two oil tubes I and I^1, the latter terminating in an elbow extending radially outward through an opening in the shaft S within the bushing b^5 to lubricate the same while the tube I terminates in an elbow extending radially outward through another opening in the shaft S just within the annular channel within the oil device comprising the star like structure F indicated in sectional view in Fig. 16 comprising an inner chamber and having the tubular arms f thereon, into which the oil is fed by the tube I. By the rotation of the member F the oil is caused to pass outwardly through the arms f and into and through the hollow crank shafts v^2 for lubricating the parts within the crank case. Opposite the center of each opening a^1 there extends from the wall A^2 and radially inward a web a^4 one of which webs is seen at a^4 in Fig. 1 and through each of these webs there is seen an oil duct f^1 for supplying oil from the crank case to the ball bearing at the end of the shaft S. The tubes I and I^1 connect with the oil cup L^2 located on the end frame member T.

A suitable lead pipe L^1 is connected with the opening t^2 and is supplied with the usual carbureter as indicated in diagram at L. Oil is supplied to the cylinders C, with the carbureted mixture, from a suitable source of supply not shown.

Refer now to Fig. 12.

While each one of the connecting members Q has any part of its opening opposite the exhaust port o^1 the burnt gases are permitted to escape and are forced therethrough from the corresponding cylinder and in the same way during that part of the rotation of the engine while each member Q has its opening opposite the port o the carbureted mixture is supplied, by the action of the engine in the usual way, therethrough and to the corresponding cylinder.

In many instances I prefer to make use of the arrangement for effecting ignition of the carbureted mixture in the cylinders by means of the apparatus now to be described reference being made to Figs. 17 and 18.

U^1 is an insulating ring provided with contacting plates u^1 secured on the inner periphery thereof and provided with lugs

or ears for engaging over the threaded and shouldered terminals k^1 of the spark plugs K and which by means of the nuts k^3 are firmly held in place, together with the ring U^1. The nuts k^3 and studs k^1 comprise the electrical connecting means between the plates u^1 and the internal mechanism of the spark plug K. This insulating ring U^1 revolves with the engine and the contacting members u^1 therein are brought into engagement successively with the contacting spring J^1 held in place by means of the nut j^1, which is threaded onto a bolt or screw extending upwardly from the insulating member j^2. Underneath this nut j^1 is secured the terminal w of the cable W. Upon the rotation of the engine then the spark plugs of the several cylinders are brought successively into electrical connection with the armature of the magneto in a way to effect ignition. The point of ignition may be advanced or retarded in the usual way by means of the usual attachments to the Bosch magneto which is the type indicated in diagram in Figs. 1 and 4, the mechanism of which is so well known in the art as to call for no further explanation herein and the operation of this feature also of my invention is believed to be sufficiently clear to call for no further description thereof.

From the above description of the construction and coöperation of the several parts of my engine it is believed that the operation of the whole is sufficiently clear to call for no further description herein.

The essential elements of my invention comprise then a series of individual units arranged in parallel relation and a central element in combination with means whereby the operation of the units effects a relative rotation between the central element and the series of units and it also consists in means for supplying through a single intake pipe combustible fluid to the explosive chambers of the individual units and in connecting each of such combustion chambers with a common exhaust pipe and also in supplying electric energy to the igniting device of each one of the series of units.

An especial advantage to be noted in this structure is that it becomes possible, by reason of this arrangement, to provide the engine with a muffler even when the series of units comprises the revoluble element, as shown in the drawings, to which arrangement however I do not hereby limit myself.

What I claim is:

1. In an engine a series of independent but connected units each comprising, a combustion chamber, a piston working therein, a crank shaft and a connecting rod between the crank shaft and piston, the combustion chambers arranged with their axes substantially parallel to each other; an element centrally disposed relative to the units; operative connections between the crank shafts and the central element comprising a sun gear on the central element and planet gears on the crank shafts; the central element terminating at one end within the series of units but outside of the sun gear and extended at the other end beyond the series of units; suitable bearings between the series of units and the central element permitting their relative rotation and maintaining their alinement; an induction and an eduction chamber mounted on the central element having suitable intake and exhaust ports; suitable supporting means for the connected system of units and for the central element permitting their relative rotation; a hollow cylindrical valve casing for each unit of the series with its bore extending radially with reference to the central element and in each casing a hollow cylindrical valve member, spring actuated against the induction and eduction chambers, to successively register with the respective ports and having a lateral opening therein and comprising an intake and an exhaust connection to the corresponding combustion chamber of the series, an ignition device for each valve chamber and means for successively energizing at suitable intervals each ignition device.

2. In an engine a series of independent but connected units each comprising, a combustion chamber, a piston working therein, a crank shaft and a connecting rod between the crank shaft and piston, the combustion chambers arranged with the axes substantially parallel to each other; an element centrally disposed relative to the units; operative connections between the crank shafts and the central element comprising a sun gear on the central element and planet gears on the crank shafts; the central element terminating at one end within the series of units but outside of the sun gear and extended at the other end beyond the series of units; suitable bearings between the series of units and the central element permitting their relative rotation and maintaining their alinement; an induction and an eduction chamber mounted on the central element having suitable intake and exhaust ports; a suitable support for the central element; a suitable bearing for revolubly supporting the connected series of units; a hollow cylindrical valve casing for each unit of the series with its bore extending radially with reference to the central element and in each casing a hollow cylindrical valve member, spring actuated against the induction and eduction chamber to successively register with the respective ports and having a lateral opening therein and comprising an intake and exhaust connection to the corresponding combustion chamber of the series, an ignition device for each valve chamber, and means for successively

energizing at suitable intervals each ignition device.

3. In an engine a series of independent but connected units each comprising, a combustion chamber, a piston working therein, a crank shaft and a connecting rod between the crank shaft and piston, the combustion chambers arranged with their axes substantially parallel to each other; an element centrally disposed relative to the units; operative connections between the crank shafts and the central element comprising a sun gear on the central element and planet gears on the crank shafts; the central element terminating at one end within the series of units but outside of the sun gear and extended at the other end beyond the series of units; suitable bearings between the series of units and the central element permitting their relative rotation and maintaining their alinement; an induction and an eduction chamber mounted on the central element having suitable intake and exhaust ports; suitable supporting means for the connected system of units and for the central element permitting their relative rotation; a hollow cylindrical valve casing for each unit of the series with its bore extending radially with reference to the central element and in each casing a hollow cylindrical valve member, spring actuated against the induction and eduction chambers, to successively register with the respective ports and having two lateral openings therein, one of which connects with and leads to the corresponding combustion chamber and comprising an intake and an exhaust connection to the corresponding combustion chamber of the series; an ignition device located at the other lateral opening of each valve member and means for successively energizing at suitable intervals each ignition device.

4. In an engine a series of independent but connected units each comprising, a combustion chamber, a piston working therein, a crank shaft and a connecting rod between the crank shaft and piston, the combustion chambers arranged with their axes substantially parallel to each other; an element centrally disposed relative to the units; operative connections between the crank shafts and the central element comprising a sun gear on the central element and planet gears on the crank shafts; the central element terminating at one end within the series of units but outside of the sun gear and extended at the other end beyond the series of units; suitable bearings between the series of units and the central element permitting their relative rotation and maintaining their alinement; an induction and an eduction chamber mounted on the central element having suitable intake and exhaust ports; a suitable support for the central element; a suitable bearing for revolubly supporting the connected series of units; a hollow cylindrical casing for each unit of the series with its bore extending radially with reference to the central element and in each casing a hollow cylindrical valve member, spring actuated against the induction and eduction chambers to successively register with the respective ports and having two lateral openings therein, one of which connects with and leads to the corresponding combustion chamber and comprising an intake and an exhaust connection to the corresponding combustion chamber of the series, an ignition device located at the other lateral opening of each valve member and means for successively energizing at suitable intervals each ignition device.

5. In an engine a series of independent but connected units each comprising, a combustion chamber, a piston working therein, a crank shaft and a connecting rod between the crank shaft and piston, the combustion chambers arranged with their axes substantially parallel to each other; an element centrally disposed relative to the units; operative connections between the crank shafts and the central element comprising a sun gear on the central element and planet gears on the crank shafts; the central element terminating at one end within the series of units but outside of the sun gear and extended at the other end beyond the series of units; suitable bearings between the series of units and the central element permitting their relative rotation and maintaining their alinement; an induction and an eduction chamber mounted on the central element having suitable intake and exhaust ports; suitable supporting means for the connected system of units and for the central element permitting their relative rotation; suitable connecting means between each combustion chamber and the induction and eduction chambers adapted to coöperate with the ports therein for suitably timing the supply to, the compression in, and the exhaust from, each combustion chamber; for each combustion chamber an ignition device and means for successively energizing at suitable intervals each ignition device.

6. In an engine a series of independent but connected units each comprising, a combustion chamber, a piston working therein, a crank shaft and a connecting rod between the crank shaft and piston, the combustion chambers arranged with their axes substantially parallel to each other; an element centrally disposed relative to the units; operative connections between the crank shafts and the central element comprising a sun gear on the central element and planet gears on the crank shafts; the central element terminating at one end within the series of units but outside of the sun gear and extended at the other end beyond the series of

units; suitable bearings between the series of units and the central element permitting their relative rotation and maintaining their alinement; an induction and an eduction chamber mounted on the central element having suitable intake and exhaust ports; a suitable support for the central element; a suitable bearing for revolubly supporting the connected series of units; suitable connecting means between each combustion chamber and the induction and eduction chambers adapted to coöperate with the ports therein for suitably timing the supply to, the compression in, and the exhaust from, each combustion chamber; for each combustion chamber an ignition device and means for successively energizing at suitable intervals each ignition device.

7. In a rotary gas engine, the combination with a central stationary member and a plurality of engine cylinders surrounding the same with their axes parallel therewith, of a circular head on the stationary member having radially opening fuel intake and exhaust ports thereon, a valve casing for each cylinder extending transversely thereof and radially of the head and a valve tube in each casing having an open end riding on the head to register successively with the ports thereof and opening into the cylinder, said valve tube being removable through the outer end of the valve casing.

8. In a rotary gas engine, the combination with a central stationary member and a plurality of engine cylinders surrounding the same with their axes parallel therewith, of a circular head on the stationary member having radially opening fuel intake and exhaust ports thereon, a valve casing for each cylinder extending transversely thereof and radially of the head and a valve tube in each casing having an open end riding on the head to register successively with the ports thereof and provided with a lateral opening communicating with the cylinder.

9. In a rotary gas engine, the combination with a central stationary member and a plurality of engine cylinders surrounding the same with their axes parallel therewith, of a circular head on the stationary member having radially opening fuel intake and exhaust ports thereon, a valve casing for each cylinder extending transversely thereof and radially of the head, a valve tube in each casing having an open end riding on the head to register successively with the ports thereof and opening into the cylinder, a removable plug in the outer end of the valve casing and a spring interposed between the plug and tube to hold the latter tight against the head, said plug permitting the removal of the spring and tube through the outer end of the valve casing.

10. In a rotary gas engine, the combination with a central stationary member and a plurality of engine cylinders surrounding the same with their axes parallel therewith, of a circular head on the stationary member having radially opening intake and exhaust ports thereon, a valve casing for each cylinder extending transversely thereof and radially of the head, an ignition device projecting into each casing at one side and a valve tube in each casing having an open end riding on the head to register successively with the ports thereof and provided with lateral openings, one to receive the ignition device and the other communicating with the cylinder.

HENRY L. F. TREBERT.

Witnesses:
MARTHA M. NELSON,
OSBORNE F. GURNEY.