

C. J. KIERUM.
HYDROCARBON ENGINE.
APPLICATION FILED OCT. 29, 1917.

1,418,307.

Patented June 6, 1922.

2 SHEETS—SHEET 1.

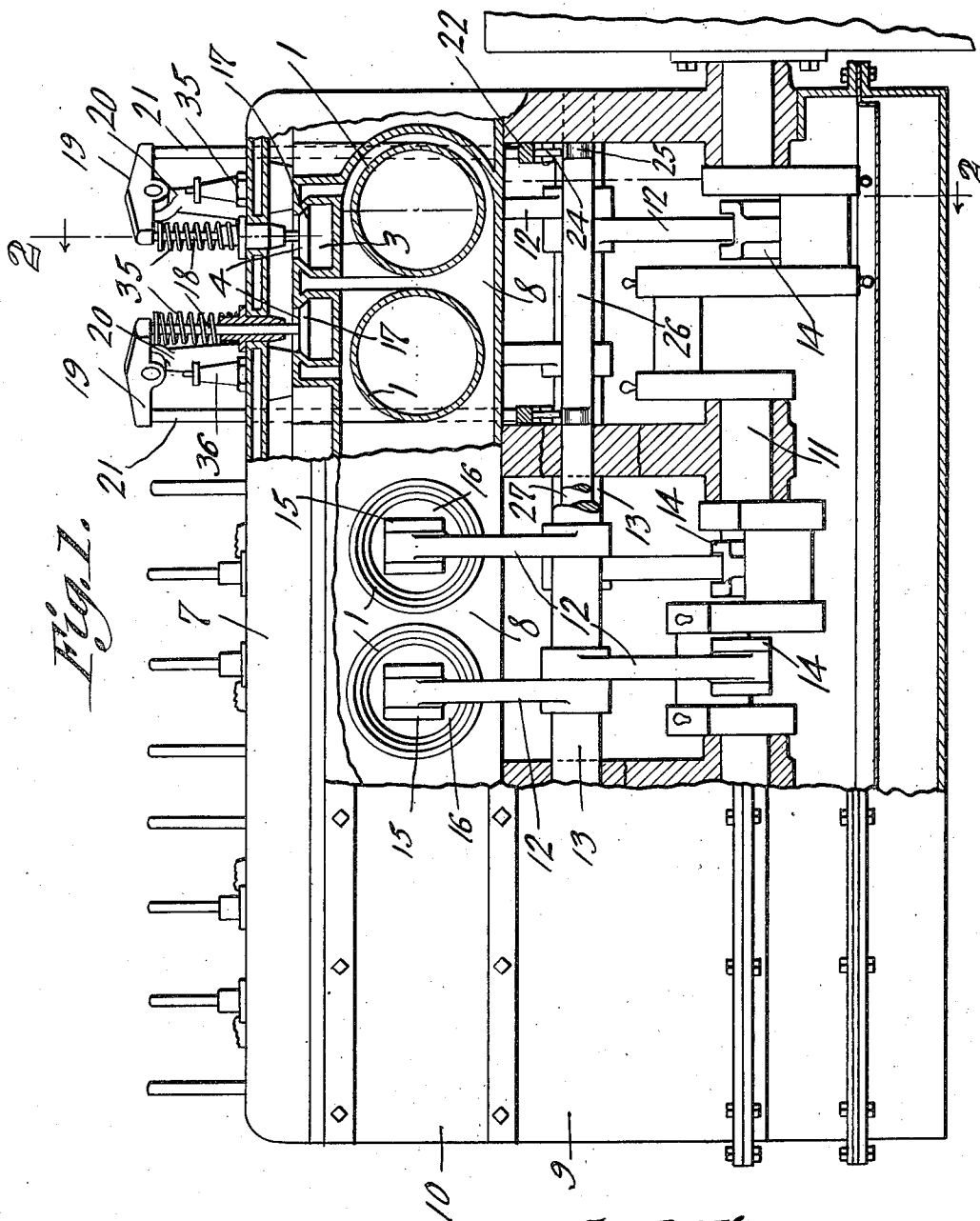


Fig. 1.

Witnesses

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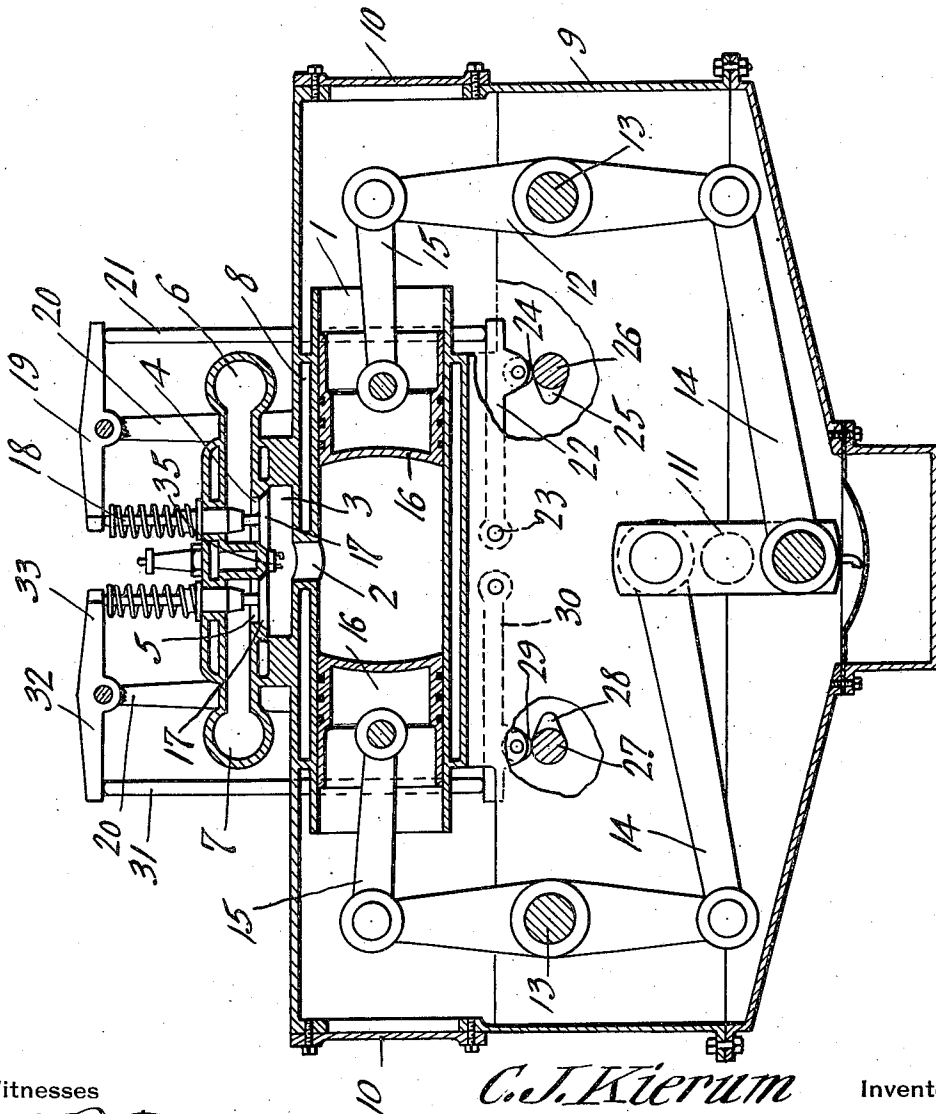
Attorneys

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2 SHEETS—SHEET 2.

Fig. 2.



Witnesses

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UNITED STATES PATENT OFFICE.

CHARLES J. KIERUM, OF SCHERTZ, TEXAS.

HYDROCARBON ENGINE.

1,418,307.

Specification of Letters Patent. Patented June 6, 1922.

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To all whom it may concern:

Be it known that I, CHARLES J. KIERUM, a citizen of the United States, residing at Schertz, in the county of Guadalupe and State of Texas, have invented a new and useful Hydrocarbon Engine, of which the following is a specification.

This invention relates to hydro-carbon engines, one of its objects being to provide an engine of this character which is free of vibration, will produce the maximum power from the fuel used, is extremely light in construction and can be built with as many cylinders as desired.

With the foregoing and other objects in view, which will appear as the description proceeds, the invention resides in the combination and arrangement of parts and in the details of construction hereinafter described and claimed, it being understood that changes in the precise embodiment of the invention herein disclosed can be made within the scope of what is claimed, without departing from the spirit of the invention.

In the accompanying drawings the preferred form of the invention has been shown.

In said drawings:—

Figure 1 is a view partly in side elevation and partly in section of a motor embodying the present improvements.

Figure 2 is a section on line 2—2 Figure 1, the valve gearing being shown in elevation.

Referring to the figures by characters of reference 1 designates the cylinder having open ends and which is provided with a central gas intake port 2 in constant communication with a valve chamber 3. Ports 4 and 5 are provided for establishing communication between the valve chamber 3 and a gas chamber 6 and an exhaust chamber 7, respectively. A water jacket 8 may be extended around the cylinder and, where several cylinders are employed in one motor, this water jacket can be extended around all of the cylinders while a single gas chamber 6 can be provided for all of the cylinders and a single exhaust chamber 7 can likewise be provided for all of the cylinders. This will be apparent by referring to Figure 1.

The cylinder or cylinders are arranged within a casing 9 having removable plates 10 in line with the open ends of the cylinders whereby access may be had readily to each cylinder at each end thereof. The cas-

ing 9 is of such size as to not only accommodate the various cylinders and their water-jackets but also to accommodate a crank shaft 11, opposed levers 12 and their pivots 13, and link connections 14 between the levers and the cranks of shaft 11. The levers 12 are arranged in pairs, one pair being provided for each cylinder, as shown in Figure 2, the upper ends of these levers being connected to pitmen 15 which extend into and are pivotally connected to hollow pistons 16 which are oppositely disposed within the end portions of one cylinder and equi-distant at all times from the port 2. The cranks on shaft 11 to which power is transmitted from the pistons of each pair are extended in opposite directions so that when pressure is simultaneously applied to both pistons, thus to produce corresponding movement of the pistons simultaneously, pressure will be simultaneously transmitted in opposite directions to two of the cranks on shaft 11, thereby to impart a rotation to the shaft.

The port 4 is normally closed by a valve 17 having a stem 18 contacting with and adapted to be actuated by a lever 19 fulcrumed on a post 20 or the like. An actuating pin 21 contacts with this lever and extends into the casing 9 where it contacts with an actuating lever 22 fulcrumed in the casing, as at 23 and provided with an anti-friction roller 24 which contacts with and is adapted to be operated by a rotating cam 25 on a shaft 26. Another shaft 27 is provided and has a cam 28 designed to engage a roller 29 carried by an actuating lever 30. This lever is adapted to transmit motion through a pin 31 to a lever 32 which in turn is adapted to press on the stem 33 of a valve 34 which normally closes the port 5. The valve chamber 3 constitutes an explosion chamber and a suitable spark plug or other ignition device indicated generally at 36 may be arranged therein.

The shafts 26 and 27 can be driven in any suitable manner so as to operate the levers 22 and 30 in the proper time relation, it being understood that each of these shafts extends transversely of all of the cylinders and has cams thereon for operating the valve mechanism of all of the cylinders.

In constructing this engine the cranks connected to the various pairs of pistons are to be set at different angles so that the explosions which take place within the differ-

ent cylinders in succession, will cause power to be applied to the shaft 11 through the various pairs of cranks successively.

It is to be understood of course that the valves 17 and 34 are normally closed, they being held closed by springs 35 mounted on the valve stems. Fuel is supplied to the gas chamber 6 in the usual or any proposed manner and by opening valves 17 and causing the pistons 16 to move apart, gas will be sucked into the cylinder 1 and between the pistons and will also fill the port 2 and the explosion chamber 3. When the pistons move toward each other they will compress the charge and as they reach the innermost limits of their movement, the charge will be exploded automatically, thus causing the pistons to move away from each other. After the force of the explosion has been spent and the pistons begin to travel toward each other, the valve 34 will open automatically permitting the burned gases to exhaust into the chamber 7. On the completion of this exhaust stroke of the pistons, the valve 34 will close automatically and the valve 17 will open automatically and permit the refilling of the explosion chamber and that portion of the cylinder between the pistons 16.

Obviously by having the mechanism arranged so that the explosions will occur in the several cylinders successively, a high powered motor can be obtained and there is practically no limit to the number of cylinders that could be used by having the parts arranged as described.

By utilizing oppositely working pistons arranged in pairs, all vibration is removed and by utilizing the peculiar construction set forth, a great saving of fuel can be effected and it becomes possible to use a lower grade

of oil than would otherwise be advisable, because of the high compression obtained.

What is claimed is:—

A hydrocarbon engine including a casing, a gas chamber extending longitudinally of the casing, and an exhaust chamber extending longitudinally of the casing, separate valve chambers each having ports communicating respectively with the said gas chamber and exhaust chamber, valves normally closing the respective ports, a plurality of units within the casing and arranged side by side, each unit including a cylinder having open ends and having a port in the middle portion opening into the adjacent valve chamber, opposed pistons mounted to reciprocate within each cylinder, a crank shaft, opposed levers within the casing, a pitman connecting each lever with its piston, a link connecting each lever with one of the cranks on the shaft, the points of connection between the cranks and links being diametrically opposed, oppositely extending normally aligning operating levers pivotally mounted at one end, parallel shafts, a cam on each shaft for each unit, said cams actuating the levers in timed relation to the rotation of the crank shaft, a lifting pin actuated by each of said operating levers, and means operated by the respective lifting pins for unseating the respective valves, and ignition means within each of the valve chambers.

In testimony that I claim the foregoing as my own, I have hereto affixed my signature in the presence of two witnesses.

CHARLES J. KIERUM.

Witnesses:

W. F. VORDENBAUMEN,
C. W. KOCH.