L. PANOSH.

ENGINE.

APPLICATION FILED MAY 7, 1914.

1,133,057.

Patented Mar. 23, 1915.

3 SHEETS—SHEET 1.

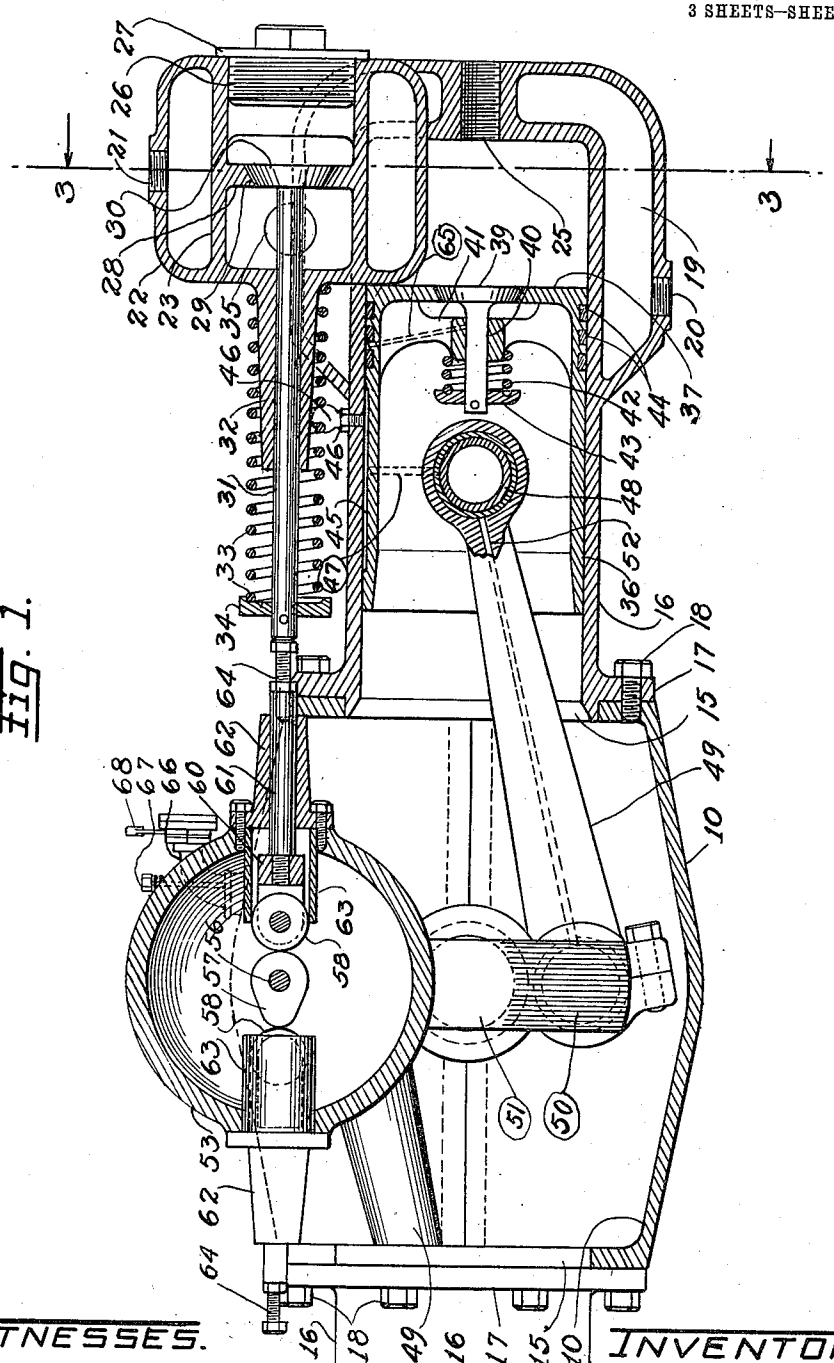


Fig. 1.

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3 SHEETS—SHEET 2.

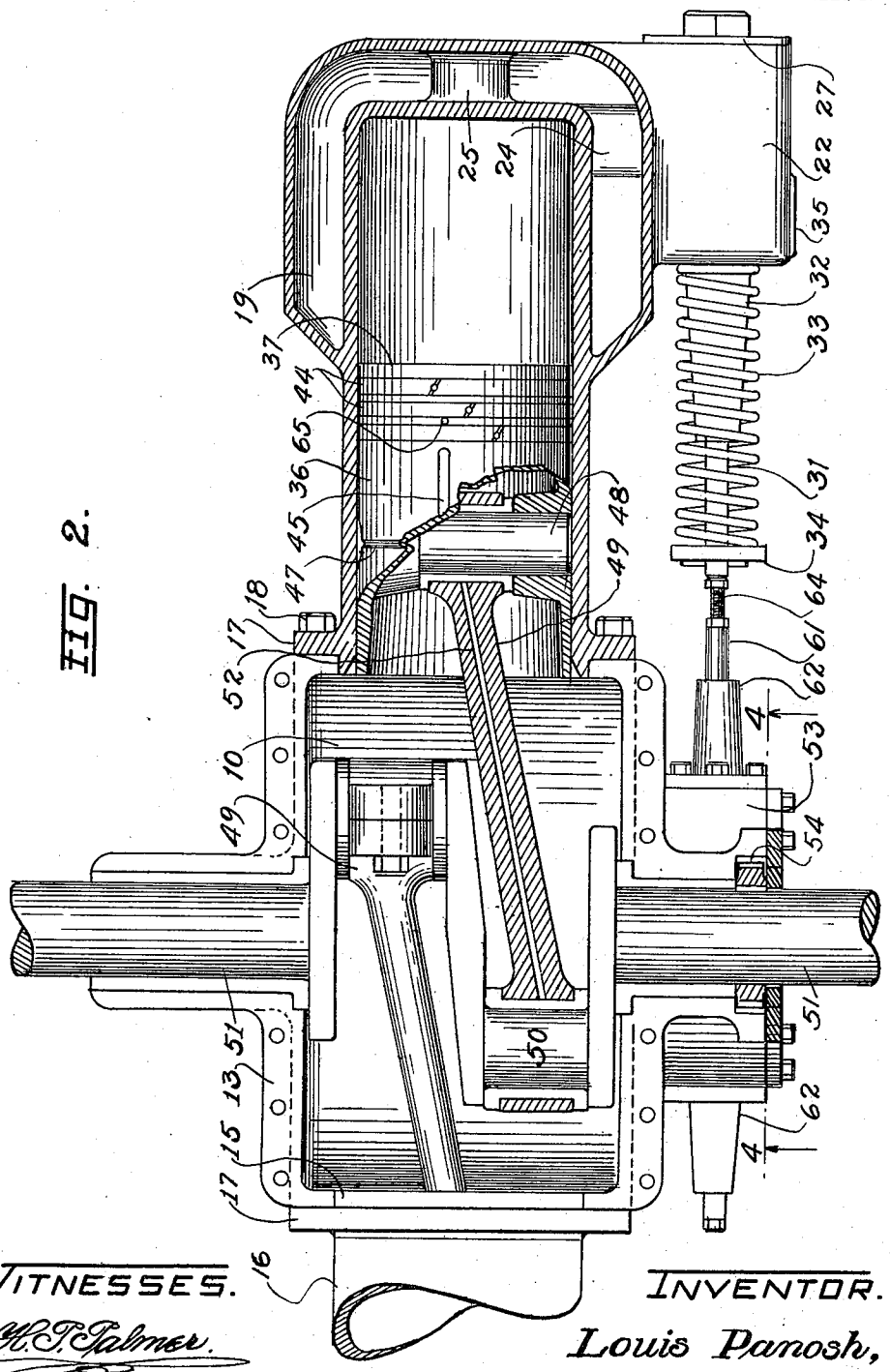


FIG. 2.

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3 SHEETS—SHEET 3.

Fig. 3.

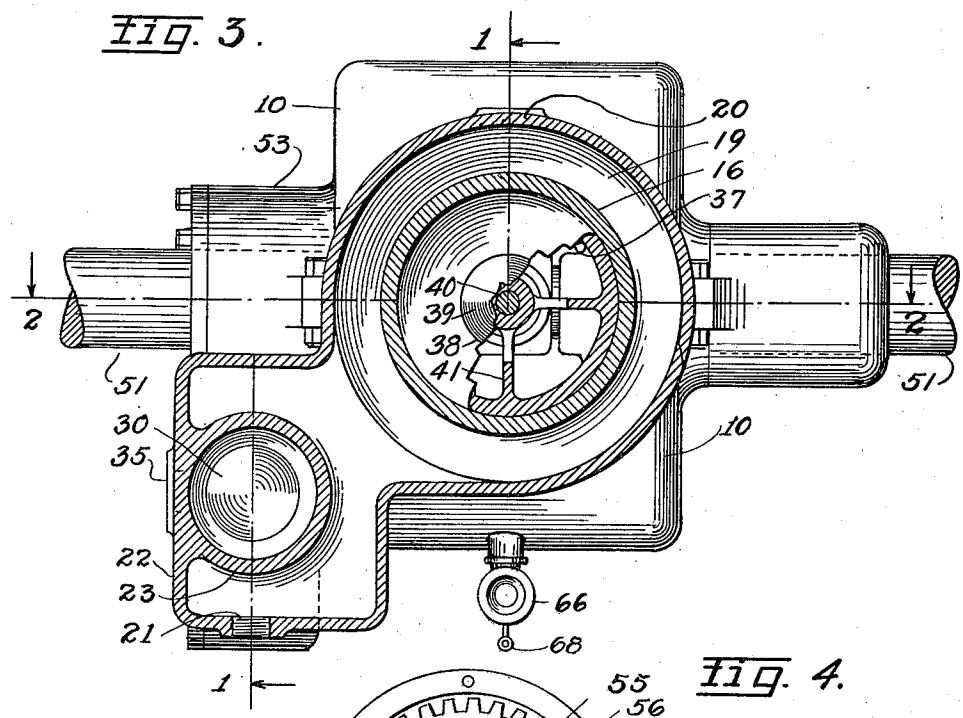
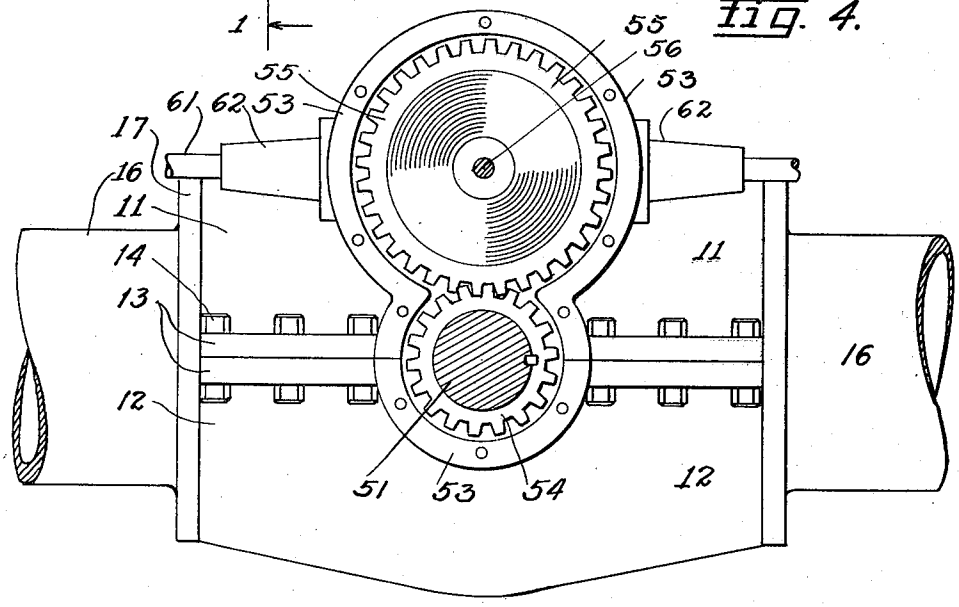


Fig. 4.



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UNITED STATES PATENT OFFICE.

LOUIS PANOSH, OF CHICAGO, ILLINOIS.

ENGINE.

1,133,057. Specification of Letters Patent. Patented Mar. 23, 1915.

Application filed May 7, 1914. Serial No. 836,868.

To all whom it may concern:

Be it known that I, LOUIS PANOSH, a citizen of the United States, residing at the city of Chicago, in the county of Cook and State of Illinois, have invented certain new and useful Improvements in Engines, of which the following is a specification.

This invention relates to certain new and useful improvements in internal combustion engines, of the type, in which two opposed cylinders, one on either side of the crank chamber or casing, is employed, and it consists in certain peculiarities of the construction, novel arrangement and operation of the various parts thereof, as will be hereinafter more fully described and specifically claimed.

The principal object of the invention is to provide an engine of the above named general character, which shall be simple and inexpensive in construction, small or compact in form, strong and durable, with its parts so made, arranged and operated as to improve the general efficiency and to greatly increase its power without material increase in the size thereof.

Another object is to provide means for compressing the explosive mixture before, as well as after it is admitted to the compression or explosion chambers of the cylinders.

Various other objects and advantages of the invention will be disclosed in the subjoined description and explanation.

In the accompanying drawings, which serve to illustrate an embodiment of the invention: Figure 1 is a longitudinal sectional view taken on line 1—1 of Fig. 3, looking in the direction indicated by the arrows; showing one of the cylinders and its operating parts, and a portion only of the other cylinder; Fig. 2 is a longitudinal sectional view, partly in elevation, taken on line 2—2 of Fig. 3, looking in the direction indicated by the arrows, but illustrating the parts in different positions from that shown in Fig. 1; Fig. 3 is an end sectional view partly in elevation taken on line 3—3 of Fig. 1, looking in the direction indicated by the arrows, and Fig. 4 is a view in side elevation of the crank chamber or casing, the gear casing and parts of the opposed cylinders, but showing the face plate of the gear case removed.

Like numerals of reference refer to corresponding parts throughout the different views of the drawings.

The reference numeral 10 designates a crank chamber or casing, which may be made of any suitable size, form and construction, but preferably of two hollow counterparts 11 and 12, each of which has at its meeting edges external flanges 13, which are firmly secured together by means of bolts 14 extended through openings in said flanges. At each of its ends the casing or crank chamber 10 is provided with an opening 15, in each of which is fitted the inner portion of a cylinder 16, each of which is provided with an external flange 17, through which are extended bolts 18 to engage the ends of the casing 10, thus firmly securing the cylinders 16 thereto and in opposed relation to one another.

As the engine cylinders and their operative parts are identical in construction, it has been deemed unnecessary to show both of said cylinders and the operative parts thereof, and in the drawings one cylinder only with its parts and a portion of the other cylinder has been shown, but it will be understood that the parts of each cylinder will operate in the same manner, but some of said parts alternately, and the following description of a single cylinder and its elements will be descriptive of the cylinder not shown and its elements.

As is clearly shown in Figs. 1 and 2 of the drawings, the cylinder 16 is surrounded at its outer portion with a jacket 19 for the circulation of water employed for cooling the explosion chamber, to which jacket water may be admitted through an opening 20 and discharged through an opening 21 in an extension 22 of the water jacket which surrounds the exhaust valve casing 23, which has communication through a channel or port 24 with the explosion chamber of the cylinder 16, which latter cylinder is provided in its outer end with an opening 25, in which may be fitted or screwed a spark plug of the ordinary or any preferred construction for igniting the gases within the cylinder. The outer end of the exhaust

valve casing 23 is provided with an opening 26 for a removable screw plug 27 used to open and close said casing and to permit of access to the interior thereof. The valve casing 23 is provided at about its middle with a transverse partition 28, having a valve seat 29 for the reception and operation of an exhaust valve 30, which carries a stem 31, which is extended through a hollow extension 32 provided on that portion of the valve casing 23 adjacent to the crank chamber. The said extension is preferably tapered as shown, and has coiled thereabout a spring 33, one end of which is adapted to rest against the casing 23, and the other against the collar or projection 34, mounted on the stem 31 near its free or inner end. The exhaust casing 23 has an exhaust port or outlet 35 to which an exhaust pipe, if desired, may be attached. Movably mounted in the cylinder 16 is a hollow piston 36, the inner end of which is open and the outer end of which is closed, by means of a head 37, having in its central portion an opening or valve seat 38 for the reception and operation of a valve 39, which is provided with a stem 40 extended centrally through a spider-like reinforcement 41, with which the piston 36 is provided just inwardly of the head 37 thereof. Surrounding the stem 40 of the valve 39 is a coiled spring 42, which rests at one of its ends against said spider and at its other end against a collar or projection 43 mounted on the inner end of said stem. The piston 36 is provided by preference with a series of annular packing rings 44 of the ordinary or any preferred construction. The piston 36 is also provided on its exterior with a longitudinally extending groove 45, which communicates with an oil cup 46 secured in a suitable opening in the cylinder 16, at any suitable point thereon. Leading from the groove 45 and circumferentially with respect to the piston 36 and on the outer portion thereof, is another groove 47, which communicates with the bearing of the journal or shaft 48, on which one end of a pitman rod 49 is journaled, the other end of which is journaled on a crank 50 extended from the crank shaft 51, which is journaled in the casing 10, and preferably about midway between the engine cylinders. The pitman rod 49 is provided with a longitudinal bore 52 which communicates through the bearing 48 with the groove 47 and leads to the bearing on the crank 50, so that oil may pass from the oil cup 46 to the last named bearing, and thus lubricate the same, as well as the piston 36 within the cylinder.

On one of its sides the crank casing 10 is provided with a gear casing or housing 53 which surrounds the crank shaft 51 and extends slightly above the upper portion of the casing 10, as is clearly shown in Fig. 4 of the drawings. Mounted on the crank shaft 51 within the gear casing 53 is a pinion 54, which meshes with a gear 55, which is larger than the pinion 54 and is journaled on a shaft 56, having its bearings in the upper portion of the gear casing 53 and journaled in parallelism with the crank shaft 51, as will be readily understood by reference to Fig. 4 of the drawings. Rigidly mounted on the shaft 56 inwardly of the gear 55 is a cam 57 which rotates with said shaft and gear and is adapted to alternately engage rollers 58 one of which is journaled on the inner end of the bracket or hanger 60, one of which brackets or hangers is mounted on the inner end of a reciprocating rod 61, which rods are extended through hollow guides or extensions 62 projected from the gear casing 53 in opposed directions and in alinement with the valve stems 31 of the exhaust valves. Each of the brackets 60 is by preference surrounded by a tubular member 63, which is secured at one of its ends in an opening in the casing 53 and extended into the said casing toward the cam 57, which members will serve as guides for the rollers 58 on the rods 61, which actuate the exhaust valves. At its outer end each of the rods 61 is provided with an adjustable screw 64, the length of which can be regulated by turning it in the proper direction, so as to adjust it with respect to the distance between the reciprocating rod 61 and the valve stem 31 of the exhaust valve. The piston 36 is provided near its outer end with a channel 65, which extends from the outer surface of the cylinder radially through one of the arms of the spider 41, to the bearing for the valve stem 40, thus providing means for the lubrication of said stem.

Mounted at a suitable point on the crank casing 10, and communicating with the cavity thereof, is a fuel or explosive mixture supply pipe 66, which may have communication with a carbureter (not shown) of the ordinary or any preferred construction. This supply pipe 66 is provided with a check valve 67, and also a regulating valve 68, the former being used to prevent the outflow of the explosive mixture and the latter being employed to regulate the quantity of the same admitted to the crank chamber.

From the foregoing and by reference to the drawings, it will be readily understood and clearly seen that, assuming the pistons 36 are at the limit of their inward strokes, and that the engine is started, it is obvious that the pistons will be moved from each other by reason of their connections to the opposed cranks 50 on the crank shaft 51, and in this operation a partial vacuum will be created in the crank chamber or casing, thus drawing explosive mixture thereinto through the supply pipe 66, and from the carbureter or source of fuel supply. Upon the return

movement of the pistons 36, it is apparent that the explosive mixture will be compressed within the crank chamber and hollow pistons until the pressure thereof is strong enough to overcome the tension of the springs 42, which normally hold the piston valves 39 in their closed positions, at which time a quantity of the mixture will pass into the compression or explosion chambers of the cylinders 16, and be compressed by the outward movement of the pistons. When the engine has been fairly started, or after one or two strokes of the pistons, the mixture within the explosion chamber of one of the cylinders will be exploded, thus causing the valve of said piston to remain closed on the inward movement of said piston, but it will be understood that the valve of the opposed cylinder will open on its inward movement, thereby allowing mixture to pass into its explosion chamber to be compressed on the return outward movement of said piston and to be exploded therein, while mixture will pass into the other explosion chamber on the next inward movement of the pistons. In the reciprocating operation of the pistons, the gear or pinion 54 on the crank shaft 51 meshes with the gear 55, causing the latter gear, as well as the cam 57, on its shaft, to rotate so as to alternately engage the rollers 58 carried by the reciprocating rods 61, to the end that the exhaust valves 30 will be alternately opened to permit of the exhaust of burnt and inert gases from the explosion chambers of the cylinders.

Having thus fully described my invention what I claim as new and desire to secure by Letters Patent is—

1. In an engine of the class described, the combination with a crank-casing having communication with a supply of explosive mixture, of a pair of opposed cylinders communicating with the casing, a crank-shaft journaled in the casing, a hollow and valved piston in each of said cylinders, connections uniting said pistons with the cranks of said shaft, an exhaust valve for each of the cylinders, and means operated by the crank-shaft to open the exhaust valves alternately.

2. In an engine of the class described, the combination with a crank-casing having communication with a supply of explosive mixture, of a pair of diametrically opposed cylinders communicating with the casing, a hollow plunger piston located in each of said cylinders and each having in its outer portion an opening for the passage of mixture from said casing to its explosion-chamber, a spring-pressed valve carried by each cylinder to close the opening therein, connections uniting said pistons with the cranks of said shaft, a spring-pressed exhaust valve for each of the cylinders, and means operated by the crank-shaft to alternately open said exhaust valves.

LOUIS PANOSH.

Witnesses:
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Copies of this patent may be obtained for five cents each, by addressing the "Commissioner of Patents, Washington, D. C."