

G. T. HANCHETT.
GAS ENGINE.

APPLICATION FILED FEB. 3, 1912.

1,065,523.

Patented June 24, 1913.

2 SHEETS-SHEET 1.

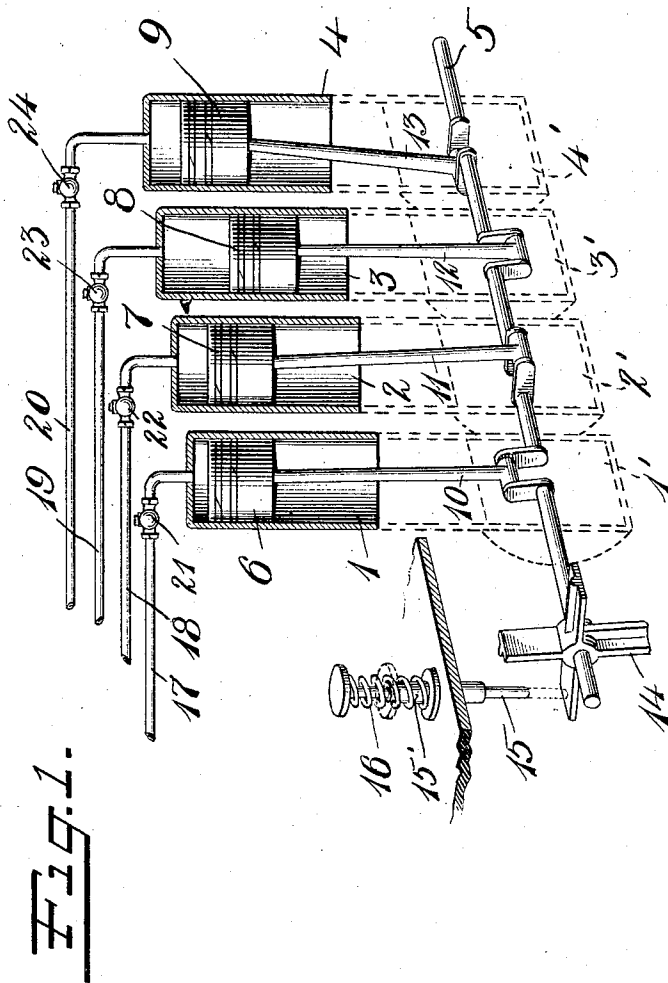


Fig. 1.

Witnesses:
Chas. W. Reed
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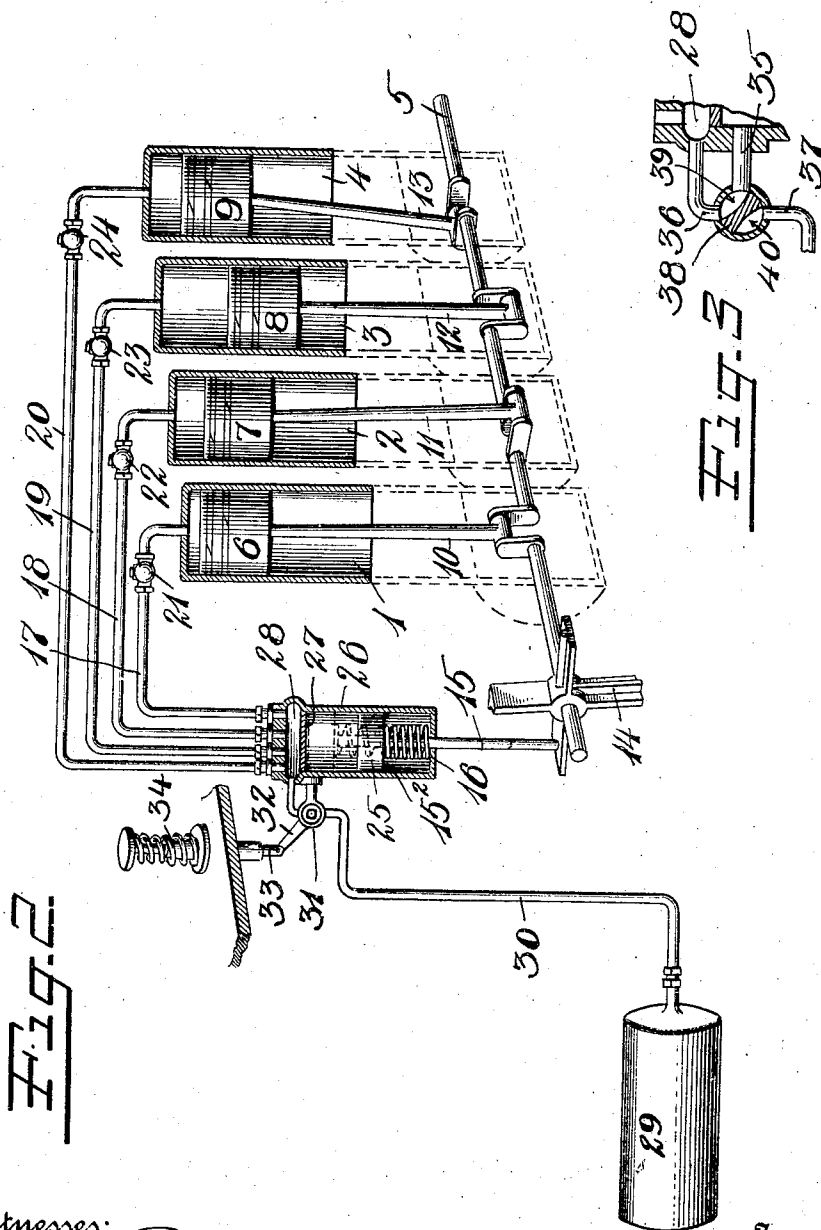
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UNITED STATES PATENT OFFICE.

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GAS-ENGINE.

1,065,523.

Specification of Letters Patent.

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To all whom it may concern:

Be it known that I, GEORGE T. HANCHETT, a citizen of the United States, residing in the city, county, and State of New York, have invented certain new and useful Improvements in Gas-Engines, of which the following is a full, clear, and exact description.

My invention relates to improvements in gas engines, and has for its object to provide means for placing the engine crank shaft in a favorable position for starting by exploding gas supplied to the cylinders from an auxiliary source.

Many attempts have heretofore been made to start gas engines by exploding charges of gas from auxiliary sources, but it has been found that, for some reason, in a large proportion of cases the engines fail to start. I have discovered that one reason for many of such failures is that the shaft of the engine is not properly positioned, with the result that either the charge does not explode, or does not in exploding act effectively to produce torque.

The object of my invention is to overcome these difficulties.

A further object of my invention is to provide means whereby a charge of gas is controlled so as to set the engine and is then forced into the engine cylinders for starting purposes.

The following is a description of an embodiment of my invention, reference being had to the accompanying drawing, in which—

Figure 1 shows in diagrammatic form apparatus embodying my invention. Fig. 2 is a modification of the same whereby the charge of gas for the engine cylinders actuates the setting means. Fig. 3 is a sectional detail.

Referring more particularly to the drawings, 1, 2, 3 and 4 represent four cylinders of a gas engine to be started. For the convenience of illustration I have selected an engine of the two-cycle type, my invention being applicable to that type as well as to engines of the four-cycle type.

1', 2', 3' and 4' are crank casings shown in dotted lines.

5 is the crank shaft of the engine having four cranks displaced by angles of 90°, as is the regular practice in four-cylinder engines of the two-cycle type.

6, 7, 8 and 9 are the pistons connected to the crank shaft by the piston rods 10, 11, 12 and 13. Connected to the shaft of the engine is a ratchet wheel 14, having four arms which are in line with the four cranks respectively.

15 is a plunger normally retracted by a spring 16 and adapted to be operated by the foot. When this plunger is depressed to the position shown in dotted lines, its movement being then limited by the top of the sleeve 15', it engages one of the arms of the ratchet wheel, if the shaft 5 is not in proper position for starting, and forces it downward, turning the crank shaft into the position shown in the drawing, which is a position favorable for starting. 17, 18, 19 and 20 are pipes leading from any suitable auxiliary sources of explosive gas, such as acetylene gas, and 21, 22, 23 and 24 are check valves in these pipes, which are closed by the back pressure due to explosions in the cylinders of the engine.

In operating my device, the plunger 15 is first forced downward, until its head engages the sleeve 15', thereby positioning the crank shaft 5 in a suitable position for starting. Gas is then introduced into the several cylinders through the pipes 17, 18, 19 and 20, and the ordinary ignition sparks produced, whereupon the charge in the cylinder 4 is first exploded, which is thereupon followed by sparks and explosions in the cylinders 1, 2 and 3 in the ordinary manner. After the first explosion in any of these cylinders, mixed air and fuel is drawn in through the carbureter in the ordinary manner, and the engine continues to operate in the ordinary manner.

In the modification in Fig. 2, the setting plunger 15 is provided with a piston 25 within a plunger cylinder 26, the cylinder being provided with stops 15² for limiting the downward throw of the plunger 15, which is retracted by the spring 16. At the top of the casting of this plunger cylinder is a separate chamber 28 formed by the wall 27, to which chambers the pipes 17, 18, 19 and 20 are connected. 29 is a tank containing under pressure gas, such as acetylene gas, and having leading therefrom a pipe 30 which is connected to a two-way valve 31, having its plug operated by an arm 32, which is connected to a plunger 33, which is retracted by a spring 34. The two-way

valve has a port 35 connected to the plunger cylinder 26, a port 36 connected to the chamber 28, and a port 37 to which the pipe 30 is connected. The plug 38 of the valve is cut away at 39, so that when the valve is in the position shown in Fig. 2, the ports 35 and 36 are connected together, thereby connecting the plunger operating cylinder 26 with the chamber 28 and pipes 17, 18, 19, 20. The plug 38 has also a cut-away portion 40, which, when the plunger 34 is depressed, connects the ports 35 and 37 together, so that the plunger cylinder 26 is connected through the pipe 30 to the tank 39.

15 The operation of this device is as follows: When it is desired to set the shaft in the proper position, the plunger 34 is depressed, so that the turn plug 38 is revolved until the tank 29 is connected with the plunger cylinder, whereupon the plunger 15 is forced down so as to engage the ratchet wheel 14 and set the shaft 5 in the proper position. Thereupon the plunger 34 is released, whereupon the valve plug 38 is turned until the port 35 is connected with the port 36, establishing a connection between the plunger cylinder 26 the chamber 28 and pipes 17, 18, 19 and 20. The plunger piston 15 is then forced upward by the spring 16, forcing the gas out of the plunger cylinder 26 through the valve 31 into the chamber 28, and thence through the pipes 17, 18, 19 and 20 into the cylinders 1, 2, 3 and 4, priming the engine for starting. By this means both the setting operation and the priming of the engine are brought about by the manipulation of the plunger 34.

As will be evident to those skilled in the art, my invention permits of various modifications without departing from the spirit thereof or from the scope of the appended claims.

What I claim is:

1. In a gas engine, the combination of a plurality of cylinders, pistons, piston rods and a crank shaft, with a ratchet mounted upon said crank shaft, a plunger having a limited throw adapted to operate said ratchet, a spring for retracting said plun-

ger, the position of said ratchet being such that when said plunger is actuated to the limit of its throw the shaft will be suitably positioned for starting by means of gas supplied from an auxiliary source to the cylinders of the engine, and means for supplying such gas to said cylinders.

2. In a gas engine, the combination of a plurality of cylinders, pistons, piston rods and a crank shaft, with a ratchet mounted upon said crank shaft, a plunger having a limited throw adapted to operate said ratchet, a spring for retracting said plunger, the position of said ratchet being such that when said plunger is actuated to the limit of its throw the shaft will be suitably positioned for starting by means of gas supplied from an auxiliary source to the cylinders of the engine, pipes for supplying such gas to said cylinders, a piston head connected to said plunger, a plunger cylinder for said piston head, a source of gas under pressure, and a valve for connecting said plunger cylinder with said source or with said pipes at different times.

3. In a gas engine, the combination of a plurality of cylinders, pistons, piston rods and a crank shaft, with a ratchet mounted upon said crank shaft, a plunger having a limited throw adapted to operate said ratchet, a spring for retracting said plunger, the position of said ratchet being such that when said plunger is actuated to the limit of its throw the shaft will be suitably positioned for starting by means of gas supplied from an auxiliary source to the cylinders of the engine, pipes for supplying such gas to said cylinders, a piston head connected to said plunger, a plunger cylinder for said piston head, a source of gas under pressure, and a valve for connecting said plunger cylinder with said source or with said pipes at different times, and spring retracted means for operating said valve.

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Witnesses:

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