

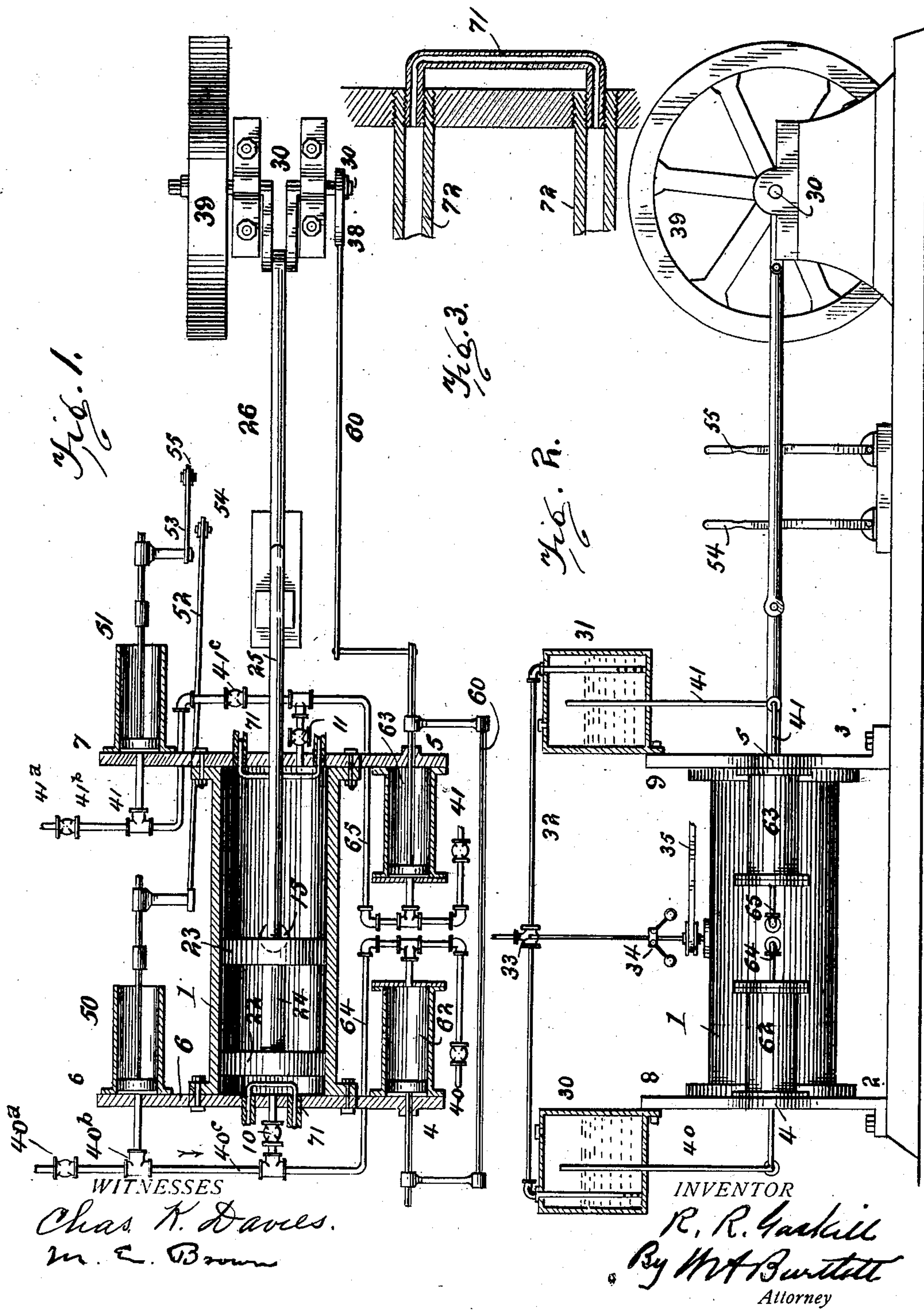
No. 742,184.

PATENTED OCT. 27, 1903.

R. R. GASKILL.
GASOLINE ENGINE.

APPLICATION FILED APR. 4, 1899.

NO MODEL.



UNITED STATES PATENT OFFICE.

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GASOLENE-ENGINE.

SPECIFICATION forming part of Letters Patent No. 742,184, dated October 27, 1903.

Application filed April 4, 1899. Serial No. 711,685. (No model.)

To all whom it may concern:

Be it known that I, ROLAND R. GASKILL, a citizen of the United States, residing at Hennessy, in the county of Kingfisher and Territory of Oklahoma, have invented certain new and useful Improvements in Gasolene-Engines, of which the following is a specification, reference being had therein to the accompanying drawings.

10 This invention relates to gasolene-engines or engines in which a mixture of gaseous vapor, usually hydrocarbon, is commingled with a proportion of atmospheric air and ignited to produce expansion and a propulsive effect.

15 The object of the invention is to produce an engine in which a single cylinder shall take in the gaseous charge at each end with each stroke of the piston in the proper direction, so that there are no idle strokes; to provide the engine with auxiliary starting-pumps, so that gas may be forced into the cylinder to start the engine without the necessity of rotating the drive or fly wheel; to connect the vapor-supply with the pumps and 25 cylinder in an effective manner, and to improve various details of construction and the mode of operation of an engine of this character.

30 Figure 1 is a partial horizontal section and partial plan of the general features of the invention, parts of the engine being omitted which are not considered necessary to the present explanation. Fig. 2 is a partial elevation and partial vertical longitudinal section, omitting some parts. Fig. 3 is a detail 35 section of a tubular connection with the cylinder-head, in which tubes the ignition device may be contained.

40 The drawings are distorted in many particulars, no attempt being made to show the relative proportion of parts, but only to indicate the invention, so that a person skilled in the art might make and use the invention.

45 The numeral 1 indicates the cylinder of the engine. This cylinder is constructed in most respects in any suitable way and preferably has a water-jacket, such being common. For convenience, strength, and compactness, however, the cylinder-heads are extended beyond the cylinder, preferably at both sides 50 and top and bottom. The extensions of the

cylinder-heads may thus become flanges or legs 2 3 to support the cylinder and connections and also heads 4, 5, 6, and 7 to the different pumps and also standards 8 9 to support the gasolene-tanks. The cylinder-heads may be of cast metal, each being integral, and excess of weight can be prevented by shaping according to the strength required. The cylinder has a gas-supply pipe or inlet 60 at each end, each pipe having a check-valve to permit gas to flow into but not out from the cylinder. 10 and 11 indicate these inlet-pipes and their check-valves, the latter being of any usual construction. The cylinder has 65 an exhaust-port 15 central of the length of the cylinder. The piston is shown as composed of two disks 22 and 23, connected with a spreader 24. The piston may be packed in any usual way, the whole space around the spreader 24 being available for such packing, if desirable. The piston-rod 25 leads through one of the piston-heads, being packed in any usual way, and the pitman 26 connected to crank-shaft 30 in usual manner. The length 75 of the piston is somewhat less than half the length of the cylinder, and its stroke is such that at the extreme of its movement it uncovers one-half of the exhaust-port 15. The extreme movement in either direction does 80 not bring the proximate end of the piston close to the cylinder-head, but leaves a chamber which may contain an igniter, and into which chamber an initial charge of gas may be introduced. These chambers at the ends 85 of the cylinder also prevent injurious effects from the accumulation of soot or other products of combustion in the bottom of the cylinder. Any large accumulation of such debris is blown out at the exhaust-port. 90

Gasolene-reservoirs 30 and 31 are located with convenient relation to the ends of the cylinder, preferably at the extensions 8 9 of the cylinder-heads. These tanks are close vessels and may be filled with gasolene or 95 like fluid through suitable valves and preferably about two-thirds full to work to best advantage. An air-pipe 32 extends from a central valve and has its ends turned down into the reservoirs and terminating in perforated sections below the level of the fluid 100 in the reservoirs, as shown. The valve 33 is

controlled from a governor 34, both valve and governor being of any approved construction, so that the valve closes as the governor moves more rapidly, as is usual with governor-valves.

5 The governor is of course actuated from the engine in any suitable way, as by drive-belt 35. The gas-supply pipes 40 and 41 extend from the upper part of the reservoirs and above the level of the fluid therein toward
10 the supply-pumps. Branch pipes connect to the hand-pumps, which will first be described.

The pipes 40^a and 41^a are supposed to be connected with pipes 40 and 41. Suppose now the piston is in the position shown in
15 Fig. 1. The hand-pump 50 is operated by means of rod 52, leading to hand-lever 54. The check-valve 40^b permits gas to pass to the pump, but prevents its return to the reservoir. The return stroke of the pump-piston therefore forces the gas through pipe 40^c
20 to the cylinder through valve and pipe 10. Assuming the gas to be ignited, the expansion of the air and gas will impel the piston toward the other end of the cylinder until the exhaust-port is opened by the passage of the
25 piston and the spent gas escapes. Should a second charge be necessary to accumulate momentum enough to start the power-pumps, the same can be supplied from the second
30 hand-pump 51 by means of connections 53 and lever 55, the gas being received through connections 41^a 41^b 41^c, substantially similar to the connections described and leading to the other end of the cylinder through valve
35 and pipe 11. Usually, however, only one hand-pump will be needed, as the momentum of parts after the ignition of one charge will generally cause the return stroke of the piston. Assuming the fly-wheel 39 on shaft 30 to be in
40 motion and the eccentric 38 on shaft 30 to be in operation, let us suppose 60 to indicate connections from said shaft by which pumps 62 and 63 are operated. These pumps take gas from the reservoirs through pipes 40 and 41
45 and by means of suitable connections, as 64 and 65, convey the gas mixture through supply-valves and pipes 10 and 11 to the chambers in the cylinder, the supply alternating at opposite ends of the piston. As the pumps are
50 outside the cylinder and operate to compress the gas and drive it toward the cylinder, the gas escape in other directions being prevented by suitable valves, as indicated or as will be understood by persons skilled in this art,

the inflow of the gas mixture to the cylinder 55 is gradual and the combustion is more nearly continuous than is the case in engines in which the gas is compressed in the cylinder and fired to produce an explosion.

Any usual ignition device may be used, 60 either electrical, incandescent, or otherwise. A convenient inclosure may be formed to contain the igniter by a tube 71, bent in the form of an ox-bow, both ends being screw-threaded. This bent tube may be inclosed 65 in the combustion-chamber of the cylinder, the two ends extending into holes in the head of the cylinder. Larger tubes 72 enter the same holes in the cylinder-head, having threaded engagement both with the cylinder- 70 head and the bent tube. The tubes 72 71 thus form a passage through which wires may be led or in which a gas-flame may be kept ignited, or other means may be employed by which the tube 71 may be used as an inclosure 75 to the ignition device, whatever that may be.

The valve 33, which governs the admission of air to the reservoirs, governs the speed of the engine, since the mixed gas can only be drawn from the reservoirs as air is admitted 80 to the reservoirs. As the air is admitted to the reservoirs it becomes carbureted by passing through the fluid and is then drawn into the pumps, as described, and thence forced to the cylinder, as has been explained. 85

What I claim is—

In a gasolene-engine of the character described, a closed supply-reservoir for hydrocarbon fluid, a pipe leading from the upper part thereof above the fluid-supply, for conveying gas to a power-driven pump, and having a branch to a hand-pump, check-valves preventing the return of gas from said pumps, pipes leading from both said pumps to the engine-cylinder, a hand-lever for operating the hand-pump, and power mechanism for operating the power-pump, whereby the hand-pump may be used as a starter or auxiliary to the power-pump, all the specified elements combined substantially as described. 90 95 100

In testimony whereof I affix my signature in presence of two witnesses.

ROLAND R. GASKILL.

Witnesses:

JOHN JOHNSON,
FRANK BURNS.