

(No Model.)

T. H. & J. T. H. PAUL.
GAS ENGINE.

No. 530,237.

Patented Dec. 4, 1894.

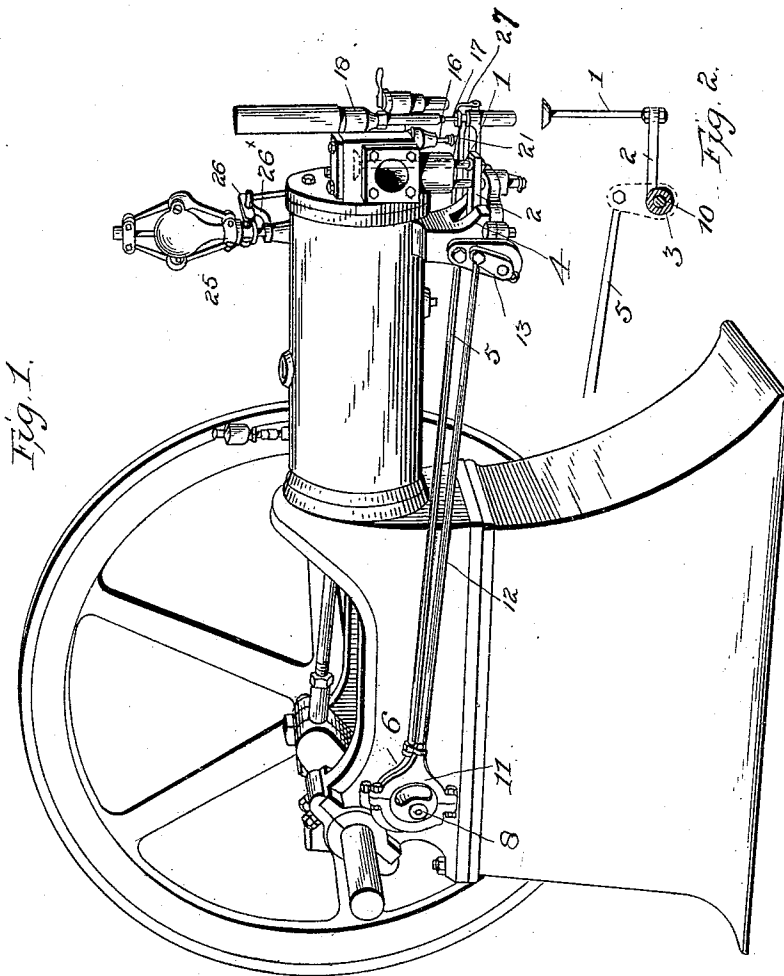


Fig. 1.

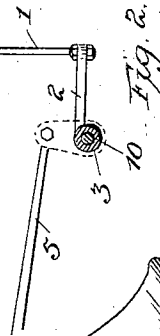


Fig. 2.

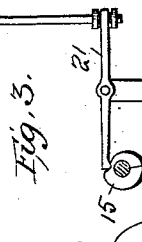
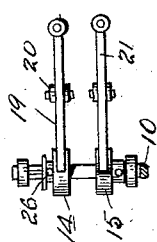


Fig. 3.

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UNITED STATES PATENT OFFICE.

THOMAS H. PAUL AND JOHN THOMAS H. PAUL, OF FROSTBURG, MARYLAND.

GAS-ENGINE.

SPECIFICATION forming part of Letters Patent No. 530,237, dated December 4, 1894.

Application filed December 12, 1893. Serial No. 493,457. (No model.)

To all whom it may concern:

Be it known that we, THOMAS H. PAUL and JOHN THOMAS H. PAUL, citizens of the United States, residing at Frostburg, in the county of Allegany and State of Maryland, have invented certain new and useful Improvements in Gas-Engines, of which the following is a specification, reference being had therein to the accompanying drawings.

It is the object of our invention to provide a gas engine having a simple and effective form of valve mechanism for controlling the same and with reference to the valve mechanism we aim to avoid complication of parts, to render the exhaust quick and certain of action and to operate both the gas and ignition valves from the same rocker mechanism comprising two rocker shafts, operated from eccentrics on the engine shaft.

In the drawings:—Figure 1, is a perspective view of the engine. Figs. 2 and 3 are detail views relating to the valve mechanism.

The general form of the engine is the same as is well known. The exhaust valve box is attached at the rear cylinder head and contains the usual form of valve as shown in dotted lines. The stem 1 extends down to connect with the lever 2 carried by the rocker shaft 3 journaled in a bracket 4 at the end of the cylinder. This shaft has a crank arm on its end outside the bracket and this is connected by an eccentric rod 5 with an eccentric 6 on the shaft 8 driven from the crank shaft of the engine by suitable gearing. Not shown. The valve lever 2 is connected with the rocker shaft at the upper surface thereof so that the full effect of the movement is given to the valve and the action thereof is sensitive and quick. The rocker shaft 3, is hollow and through it another shaft 10 extends and this is connected with a second eccentric 11 through a connecting rod 12 and crank arm 13. These two shafts arranged in the peculiar manner shown constitute what may be termed a compound rocker shafting. The second shaft carries the cams 14—15 for operating both the gas inlet valve and the ignition valve. The stem of the gas inlet valve is shown at 16 and the stem of the ignition

valve at 17 and the valve box at 18. A lever 19 pivoted in ears 20 on the supporting bracket engages the stem of the gas inlet valve and this lever is operated by a cam 14 on the shaft 10. A similar lever 21 operated by the cam 15 is connected with the stem of the ignition valve to operate it and these cams are constructed and arranged to operate the valves in proper order and at proper times. All of these parts are carried at one end of the cylinder, the arrangement being both compact and simple. The same bearing serves for both the shafts and the same bracket supports all the parts. The governor shown at 25 has a bell crank lever 26 pivoted in a bracket or arm 26^x the long arm of which extends down and engages the cam of the gas valve so that it will shift the same laterally on its shaft out of line with the cam lever and thus miss the inlet of one charge of gas when the engine runs above a predetermined speed. The governor may be of any approved pattern and that shown is of the ball type. We provide a latch 27 for holding the ignition valve open when the engine is running at full speed.

It will be understood that we do not limit ourselves to the precise arrangement of the rocker shafting, that is, one extending through the other as the shafts may be arranged separately and accomplish the same purpose though we prefer the arrangement shown as being the simplest and most effective. The cams on the cam shaft are arranged in reversed position with relation to each other so that as the shaft rocks one way it operates one valve for instance, the gas inlet valve, and when it rocks the other way the other cam acts to open the ignition valve.

We claim—

1. In combination in a gas engine, the gas inlet valve, the ignition valve, the means for operating them and the latch for holding the ignition valve open in ignitable position, substantially as described.

2. In combination in a gas engine, the cylinder, the inlet, exhaust and ignition valves, the rocker shafting comprising the two shafts one of which passes through the other, the

arms on said shafts one outside the other, the
eccentric rods connected thereto, the arm on
one of said shafts connected to the exhaust
valve and the two cams on the other shaft re-
5 versed in position relatively to each other
and the levers operated alternately by the
said cams and connected to the inlet and ig-
nitition valves, substantially as described.

In testimony whereof we affix our signatures
in presence of two witnesses.

THOMAS H. PAUL.
J. THOMAS H. PAUL.

Witnesses:

JOHN GOLDSWORTHY,
THOS. G. PORTER.