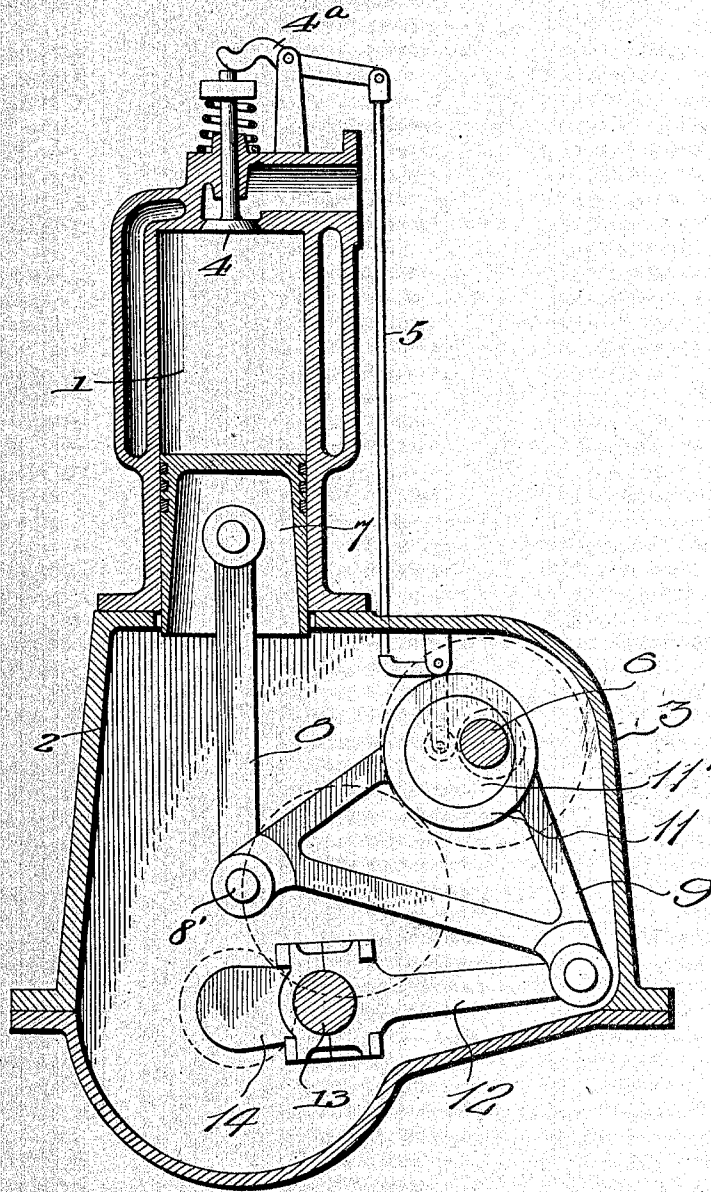


G. E. BABCOCK.
VARIABLE STROKE INTERNAL COMBUSTION ENGINE.
APPLICATION FILED JAN. 7, 1915.

1,174,801.

Patented Mar. 7, 1916.



Inventor

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Witnesses
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C. [unclear]

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UNITED STATES PATENT OFFICE

GEORGE E. BABCOCK, OF ROCHESTER, NEW YORK.

VARIABLE-STROKE INTERNAL-COMBUSTION ENGINE.

1,174,801.

Specification of Letters Patent.

Patented Mar. 7, 1916.

Application filed January 7, 1915. Serial No. 1,042.

To all whom it may concern:

Be it known that I, GEORGE E. BABCOCK, a citizen of the United States, residing at Rochester, in the county of Monroe and State of New York, have invented certain new and useful Improvements in Variable-Stroke Internal-Combustion Engines; and I do declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

My invention relates broadly to improvements in internal combustion engines and more particularly to those of the four-cycle type.

The object of the invention is to provide means between the crank shaft and the piston of the engine for varying the stroke of the latter, whereby the suction stroke is followed by a shorter compression stroke, the latter being followed by a comparatively long expansion stroke, and the cycle being completed by a still longer exhaust stroke.

In reducing the idea to an operative structure, I employ certain novel features of construction and combination hereinafter more fully described and claimed and shown in the drawing wherein a vertical section of the improved engine is shown.

In the embodiment illustrated, a cylinder 1 is shown as mounted upon a crank case 2, the latter having a lateral offset 3 for the reception of means to be described. The upper end of the cylinder is equipped with any appropriate form of valves 4, one of these valves being here shown as operated by a rocker arm 1^a which it tilted around its pivot by an upright rod 5, the latter being oscillated vertically by the rotation of a cam shaft 6 which is located in the offset 3.

Slidably mounted in the cylinder 1 is a piston 7 from which a connecting rod 8 depends into the crank case 2, the lower end of said connecting rod being pivoted at 8' to one end of a triangular lever 9, another angle of said lever being provided with a bearing 11 mounted upon an eccentric 11' which is carried by the cam shaft 6. Pivoted to the third angle of the lever 9 is a second

and horizontal connecting rod 12 which is provided with a bearing within which the crank 13 of a crank shaft 14 revolves, this crank shaft lying parallel to and being spaced from the cam shaft 6 as shown.

With the parts constructed as above described, the shaft 6 is adapted to be rotated by suitable means from the shaft 14, the latter moving at a speed twice as great as the former. By this construction and arrangement of parts, the intake stroke of the engine is followed by a shorter compression stroke, then a comparatively long expansion stroke takes place while the cycle is completed by a still longer exhaust stroke, thereby exhausting all of the burnt gases from the cylinder and positively preventing preignition.

From the foregoing description, taken in connection with the accompanying drawings, it will be seen that very simple structure has been provided, yet that this arrangement of parts will greatly increase the efficiency of internal combustion engines.

I claim:—

In an internal combustion engine, the combination with a crank case, a cylinder extending therefrom and having a valve in its head, a crank in the crank case, a piston in the cylinder, and a rotating cam shaft in the crank case for operating the valve in timed relation to the piston; of a connecting rod pivoted to the piston, a triangular lever in the crank case pivoted at one of its angles to the connecting rod, an additional connecting rod disposed substantially at right angles to the other rod and pivoted to another angle of the lever and to the crank, a bearing ring carried rigidly by the remaining angle of the lever, and an eccentric on the cam shaft received rotatably in said bearing ring.

In testimony whereof I have hereunto set my hand in presence of two subscribing witnesses.

GEORGE E. BABCOCK.

Witnesses:

T. LYNN WILLIAMS,
F. P. MEYER.