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C. L. LAWRANCE

INTERNAL COMBUSTION ENGINE

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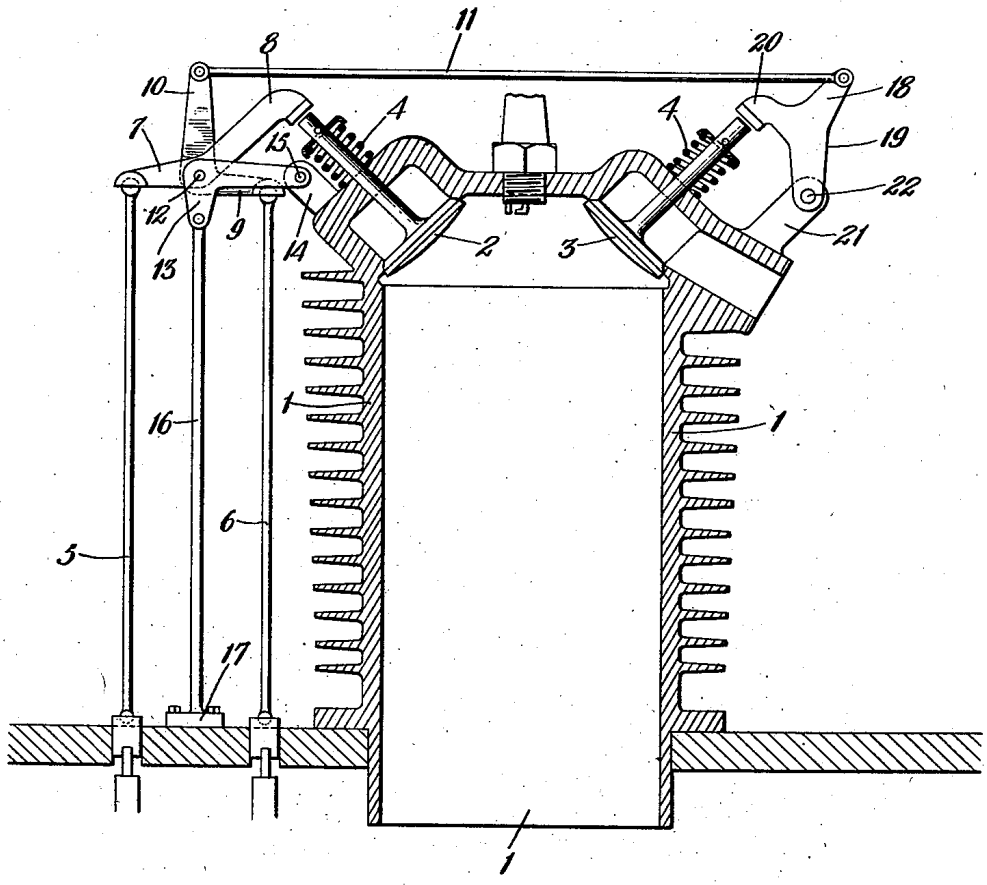

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By his Attorney,
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INTERNAL-COMBUSTION ENGINE.

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This invention relates to internal combustion engines, particularly of the overhead valve type and has for its object to provide simple and efficient means for operating the exhaust and intake valves of such engines. The advantages of my invention clearly appear from the following description and the accompanying drawings:

The figure is a side view in section of an embodiment of my invention.

In the drawing, a cylinder 1 of an internal combustion engine has exhaust valve 2 and inlet valve 3, with springs 4, 4 tending to hold their respective valves firmly seated.

Exhaust push rod 5 and inlet push rod 6 are respectively actuated by tappets and cams according to common practice, the actuation of these push rods being no part of my invention, and therefore, as they are well known, are not here described. Exhaust push rod 5 is suitably connected to arm 7 of exhaust bell crank whose arm 8 is adapted to contact with and unseat exhaust valve 2. Intake push rod 6 is suitably connected to arm 9 of intake bell crank whose other arm 10 is suitably connected to rod 11. The two bell cranks are pivotally carried on pin 12 of bracket 13 attached to cylinder extension 14 by bolt 15 and supported by bar 16 whose enlarged lower portion 17 is bolted to the crank case. Rod 11 is also connected to arm 18 of an actuating crank 19, having arm 20, adapted to contact with and unseat valve 3. Actuating crank 19 is suitably supported by cylinder extension 21 carrying pivot pin 22 upon which the actuating crank may rock.

In operation, exhaust push rod 5 actuates arm 7 of exhaust bell crank, thereby causing arm 8 to unseat exhaust valve 2. Intake push rod 6 acuates arm 9 of intake bell crank, thereby causing its other arm 10 to move rod 11, so that arm 20 of actuating crank 19 will contact with and unseat valve 3. The valves are seated again by means of their respective spring members and according to well-known practice, my invention not relating to such methods of seating nor to the sequence or timing of opening and seating.

It is obvious that many variations of the invention herein described and claimed are possible without departing from the substance thereof. For example, a cylinder may contain more than one exhaust valve or more than one intake valve while the arrangement or nature of the various parts of my invention may vary from those shown. For these reasons, what I understand to be and therefore claim as my invention is the following.

I claim:

1. The combination of an engine cylinder having inlet and exhaust ports at opposite sides thereof; poppet valves controlling said ports; a fulcrum at one side of said cylinder; a bell crank and a valve actuating rocker, both mounted on said fulcrum, said rocker being in operative relation with one of said valves; a valve rocker in operative relation with the other of said valves and a link connecting said last named rocker and said bell crank.

2. The combination of an engine cylinder having inlet and exhaust ports at opposite sides thereof; poppet valves controlling said ports; a crank case on which said cylinder is mounted; a removable valve gear supporting structure connected with said case and cylinder at one side of the latter; a valve rocker and bell crank pivoted coaxially in said structure, said rocker being arranged to actuate one of said valves; a second valve rocker pivoted on the other side of said cylinder and arranged to actuate the other of said valves, a link connecting the second rocker and said bell crank; and valve actuating means acting respectively on said first named rocker and said bell crank.

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