J. Crampton,

Oscillating Steam Engine.

No. 84,615. Patented Dec. 1, 1868.

Fig: 1.

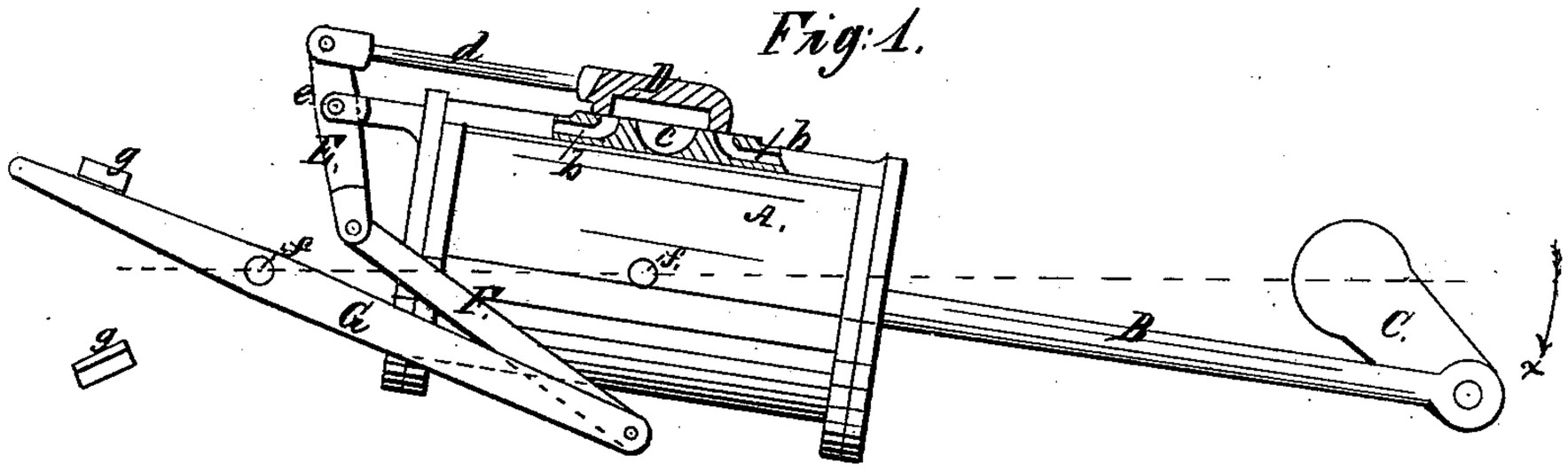
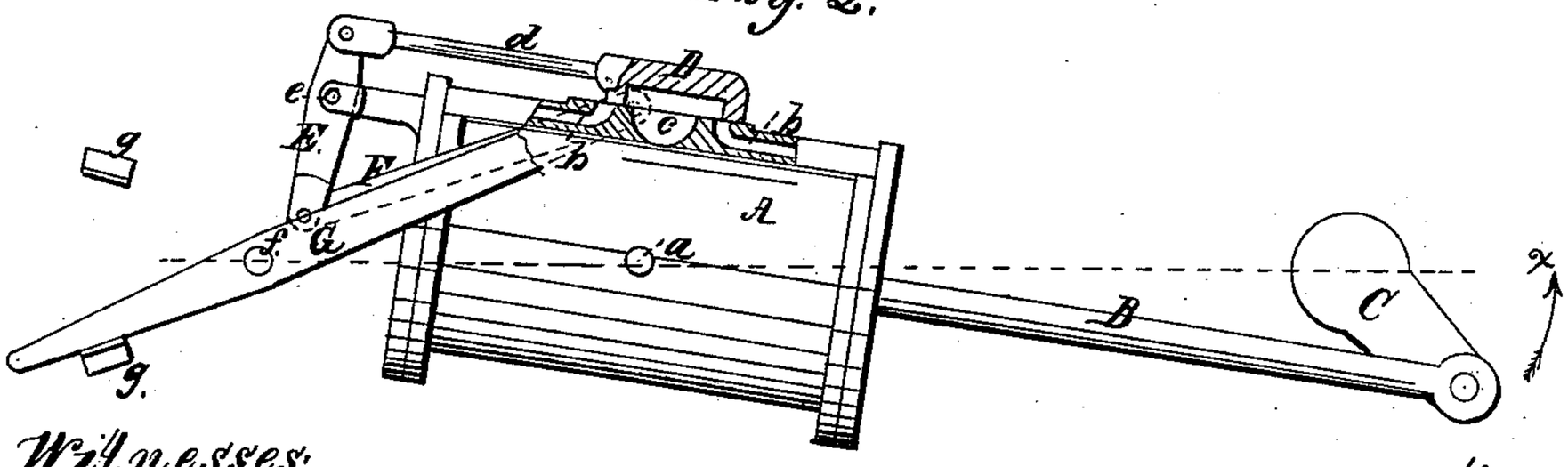


Fig: 2.



Witnesses:

A Lellere

A Kinnier

Inventor:

Joseph. Crampton,

United States Patent Office.

JOSEPH CRAMPTON, OF NEW YORK, N. Y.

Letters Patent No. 84,615, *dated December* 1, 1868.

IMPROVEMENT IN STEAM-ENGINE VALVE-GEAR.

The Schedule referred to in these Letters Patent and making part of the same

To all whom it may concern:

Be it known that I, JOSEPH CRAMPTON, of the city, county, and State of New York, have invented a new and useful Improvement in Reversing-Gear for Oscillating Engines, of which the following is a full, clear, and exact description, reference being had to the accompanying drawing, forming part of this specification, and in which—

Figures 1 and 2 represent longitudinal views or elevations of an oscillating engine in part, with my improved reversing-gear applied thereto, and in opposite positions, to reverse the action of the engine.

Similar letters of reference indicate corresponding parts in both figures.

This improvement in reversing-gear for oscillating engines consists in attaching the valve-gear to a reversing-arm or lever, arranged, in swinging it, to cross to opposite sides of the cylinder-trunnions, whereby, accordingly as said lever is thrown to the one side or other, the valve is shifted, to reverse the action of the engine, said improvement thus forming a most simple and efficient reversing-gear, and the reversing-lever made to constitute the fixed point or tie to the valve-gear, to secure the operation of the valve by the oscillation of the engine-cylinder.

Referring to the accompanying drawing—

A is the engine-cylinder, arranged to oscillate on trunnions or a centre, *a*.

B is the piston-rod, and

C, the crank operated by it.

D represents the engine-valve, carried by or on the cylinder A, and which may be of any suitable kind to control steam and exhaust-ports or passages, *b b* and *c*, the same here being shown as a slide-valve of ⊐-form, arranged to reciprocate in direction of the length of the cylinder.

This valve is connected, by its rod or stem, *d*, to a double-arm lever or beam, E, having its fulcrum, as at *e*, carried by the cylinder.

F is a link or rod, pivoted, at its one end to the beam E, and at its other end to a reversing-lever, G, which is shown as working on a fixed fulcrum, *f*, and as being at liberty to play between stops *g g*, the fulcrum *f* to said lever being in the same line or plane as the cylinder-trunnions and crank-shaft, or otherwise being so arranged as that said lever may be swung to cross a line running parallel with the axial line of the cylinder, or, in other words, be thrown to opposite sides of the cylinder-trunnions, as represented in the drawing.

From this description, it will be seen that while the lever G forms, by the attachment of the rod F to it, a tie or point of rest for the operation of the valve by the oscillation of the engine-cylinder to keep up the reciprocating action of the piston, said lever, by being thrown to opposite sides, as it were, of the cylinder-trunnions, so shifts the valve as to secure a reversed action of the engine, as clearly represented in figs. 1 and 2, where the changed motions of the crank, consequent on such shifting of the valve, are indicated by arrows *x x*.

This forms a very simple and efficient reversing-gear, and, by adjusting the lever G midway of the stops *g g*, so adjusts the valve as to stop the engine.

What is here claimed, and desired to be secured by Letters Patent, is—

The combination of the reversing-lever G, link F, and valve-operating beam E, the whole arranged relatively to each other, and to the cylinder-trunnion and valve, substantially as and for the purpose herein specified.

JOSEPH CRAMPTON.

Witnesses:

A. LE CLERC,

A. KINNIER.