R. L. Reamy & J. S. Cornell
Valves and Valve Gear of Steam
No. 75,459 Pumps &c.

Fig. 1.

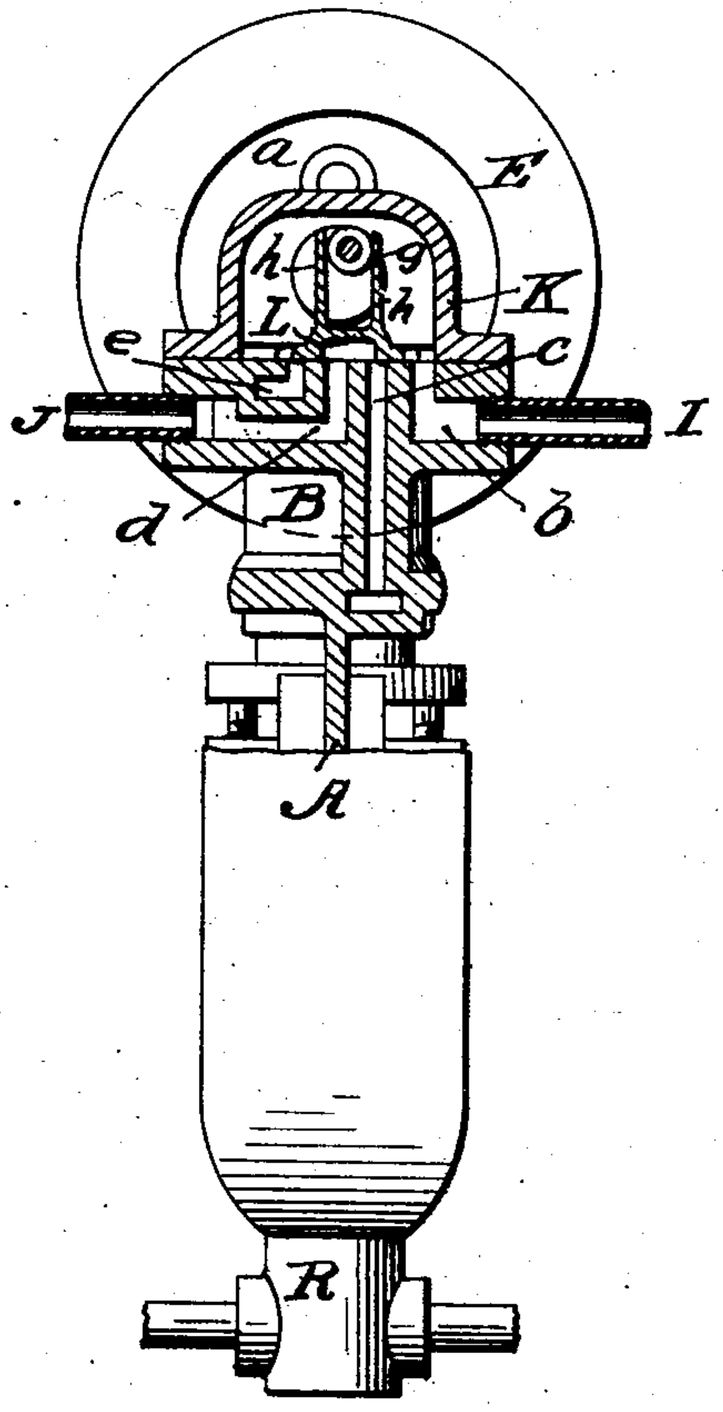
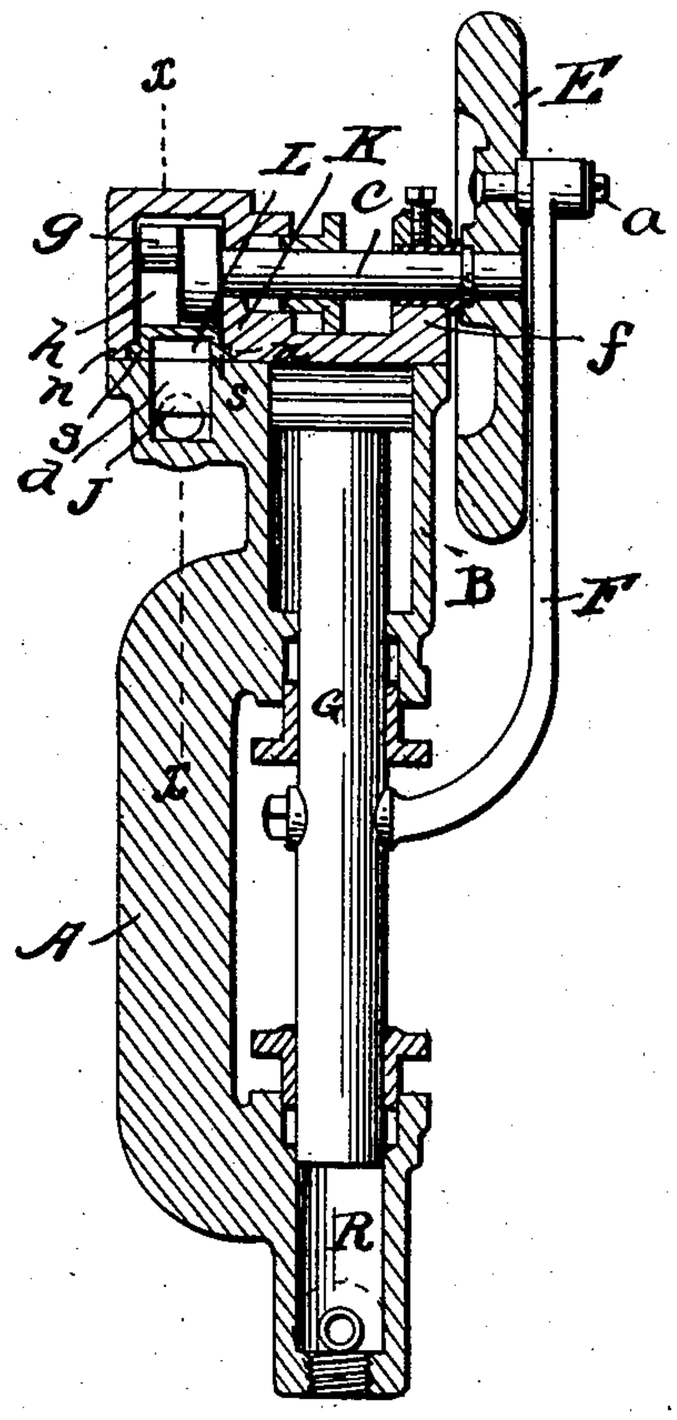


Fig. 2.



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Letters Patent No. 75,459, *dated March* 10, 1868.

IMPROVEMENT IN VALVE-GEAR FOR STEAM-ENGINES.

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

TO ALL WHOM IT MAY CONCERN:

Be it known that we, ROBERT L. REANEY, of Jersey City, in the county of Hudson, and State of New Jersey, and JOHN S. CORNELL, of Brooklyn, in the county of Kings, and State of New York, have invented a certain new and useful Improvement in Valves and Valve-Gear of Direct-Acting Steam-Engines or Pumps, 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—

Figure 1 represents a partly sectional elevation of a steam-pump, taken mainly as indicated by the line *x x* in fig. 2, and with our improvement applied thereto, and

Figure 2 a sectional elevation, at right angles to fig. 1, of the same.

Similar letters of reference indicate corresponding parts.

This, our improvement, consists in a novel arrangement of steam-cylinder with its valve, and means for working the latter, whereby a multiplicity of steam-joints is avoided. Both the end of the cylinder and surface upon which the valve works are or may be upon the same level, and be simultaneously dressed or planed, and the piston and valve exposed on removal of the steam-chest, also, whereby the valve has its sliding-motion given it by the rotation of the crank-shaft in a direct or positive manner, without the use of a pitman, whereby a general simplicity and compactness is effected. Likewise our improvement consists in a combination of flanges and grooves for supporting and guiding the valve when driven in an irregular manner, as regards leverage, having a tendency to tip it, and serving generally to support it when working in different positions.

Referring to the accompanying drawing, A is the frame of a single-acting steam-pump, which may be of any appropriate shape, and be secured by bolts to suitable framing. This frame carries at its top the working or steam-cylinder, with its valve, and pump-barrel, with its valves below. B is the steam-cylinder, the top end of which is on the same level as the valve-seat, so that both may be planed or faced simultaneously. The crank-shaft C lies over the upper end of the working-cylinder, at right angles to its axis, and has its cranked connection with the ram established through a small disk or fly-wheel, E, eccentric-pin, *a*, and pitman, F, pivoted to the ram, and bent so as to connect in a direct manner the ram and rotating disk or fly-wheel. The ram G is or may be made in one piece, to form both the plunger to the pump-barrel R, and piston to the steam-cylinder B. I is the steam and J the exhaust-pipe to the cylinder B, and *b*, *c*, *d*, and *e*, the ports or passages cast in common with the cylinder, and covered by the valve or steam-chest K, the flange of which is extended to also cover the upper end of the working-cylinder, so that on taking off said chest, both valve and passages, and the working-piston are exposed for the purposes of repair or otherwise, while a multiplicity of steam-joints is avoided, and a compactness and simplicity given to the whole by the general construction and arrangement of parts herein described, and represented in the drawing. The shaft C, which is arranged in a line at right angles to the face of the valve, at a suitable distance above it, may work, at or near its one end, in a bearing, *f*, also preferably cast with the flange or base portion of the steam-chest, and through a stuffing-box in the steam-chest at its other end, and carries at the extremity of its inner end a disk or arm, to which is pivoted, in eccentric relationship to the shaft, a roller, *g*, for operating the valve L. This valve in its general character is of □-shape, having the live-steam acting on its back and exhausting by or through a suitable cavity in its face, but is formed with ears *h h* projecting upwards from its back for the roller *g* to act against in operating the valve. Such a construction and arrangement of parts forms not only a direct but very simple mode of operating the valve, but as the roller *g*, as it is rotated by the shaft, acts at different leverages on the ears *h h*, and, at certain periods on a long leverage, to tip the valve from or on its seat, or to exert such tendency, and which defect the varying inequality in pressure of the exhaust-steam on the under face of the valve rather aggravates, we form the valve with side flanges *s s*, arranged to slide in grooves *n n*, made in the face of the valve-chest, which keeps the valve from being tipped or disturbed other than in its proper line of motion by the roller *g*, and that will serve to sustain or hold up the valve when working in an inverted, vertical, oblique, or other position to that shown for it in the drawing. Though not here represented, the usual suction and delivery-valves may be provided the pump.

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

1. The arrangement of the cylinder B, the valve-passages *b c d e*, and inlet and outlet-pipes I J, so that the steam-chest K and cylinder-cover being in one piece, may cover both the end of the cylinder, its valve, and passages, substantially as shown and described.

2. The construction and arrangement of the valve L, the shaft C, and its eccentric-pin *g*, relatively to the cylinder B, connecting-rod F, and rod or ram G, essentially as shown and described.

3. The slide-valve L, with its ears *h h*, acted upon by an eccentric-pin or roller on the end of the main shaft *c*, as shown and described.

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