C. ROGERS.

Steam-Engine Valve-Gears.

No. 149,068. Patented March 31, 1874.

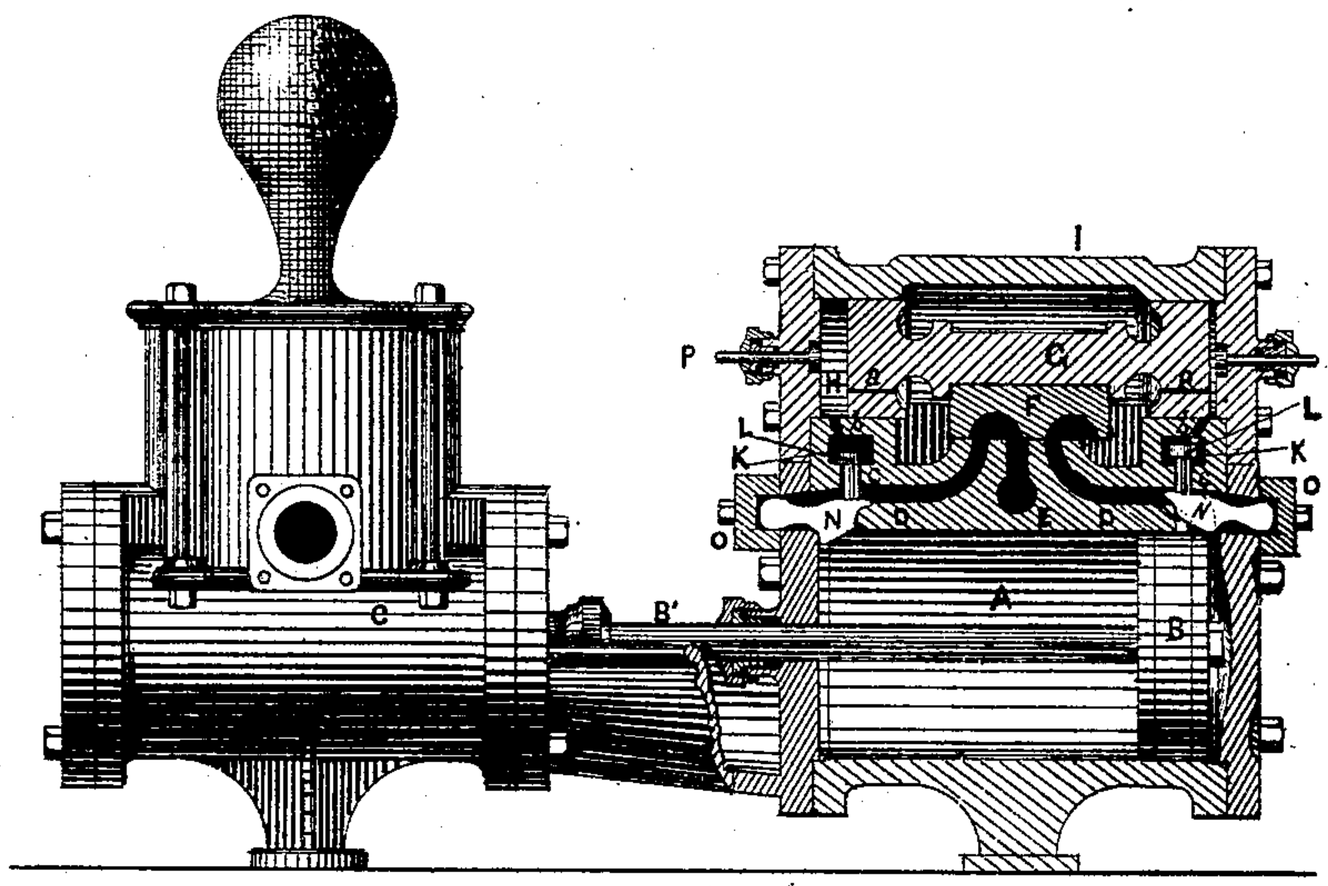

Fig. 1.

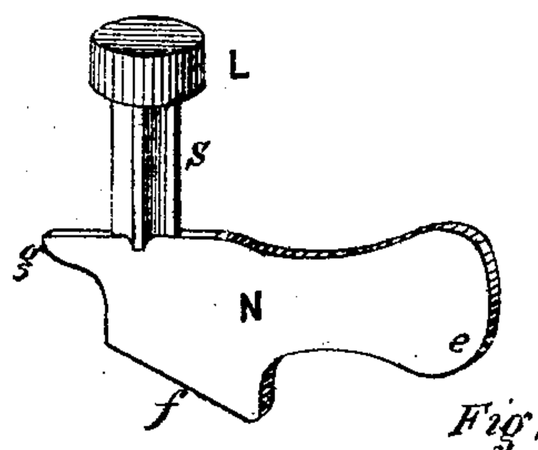

Fig. 2.

Witnesses { James A Hutchison / Francis L Clark }

Inventor Chas Rogers

UNITED STATES PATENT OFFICE.

CHARLES ROGERS, OF ALLEGHENY, PENNSYLVANIA, ASSIGNOR TO JAMES A. HUTCHISON, OF PITTSBURG, PENNSYLVANIA.

IMPROVEMENT IN STEAM-ENGINE VALVE-GEARS.

Specification forming part of Letters Patent No. **149,068**, dated March 31, 1874; application filed January 29, 1874.

CASE B.

To all whom it may concern:

Be it known that I, CHARLES ROGERS, of the city of Allegheny, in the county of Allegheny and State of Pennsylvania, have invented new and useful Improvements in Steam-Engine Valve-Gear; and I do hereby declare the following to be a full, clear, and exact description thereof, reference being had to the accompanying drawings making a part of this specification, in which—

Figure 1 is a side view of an engine and pump, showing a vertical central section of the steam-cylinder; Fig. 2, a detail section on an enlarged scale, showing the construction of the auxiliary valve.

My invention relates to the mechanism for operating the slide-valve in direct-acting engines, *i. e.*, engines dispensing with the fly-wheel and crank.

To enable others skilled in the art to make and use my improvement, I will proceed to describe its construction and mode of operation.

In the drawing, A is the steam-cylinder; B, the piston; B′, the piston-rod, which connects with a pumping-piston in the pump C, or connection may be made with any other device or machine for communicating power. D D, steam-ports; E, exhaust-ports; F, slide-valve, operated by the double-headed piston G, to which it is secured. This piston fits in the small cylinder H, which forms the upper part of the steam-chest I. The live steam is admitted to both ends of the piston G through the small steam-port *a a*, giving a uniform pressure on all sides of the piston, which is, therefore, perfectly balanced. *b b* are steam-ports communicating from the cylinder H to the auxiliary valve-chambers *k k*, from which other ports, *c c*, open into the steam-ports D D. The ports *c c* are closed by the auxiliary valves L L. These valves are ground to their seats, and have wings, *s*, which fit loosely in the ports *c c*, and project into the steam-ports D D, resting on the bars N N, one of which, with the valve, is shown in Fig. 2. The ends *e* of these bars are slightly rounded, and project through the cylinder-heads, resting in the steam-tight caps *o o*, bolted to the cylinder-heads. The lower edges of the bars are inclined, as shown at *f*, the inclined edges facing each other, and project into the cylinder in the path of the piston, the points *g* resting in slots cut in the lower side of the ports D D. When near the end of its stroke the piston comes in contact with the inclined surface *f* of the bar N and forces the end *g* up, the end *e* being held in the cap *o*, which allows the bar to rock on the rounded part *e*. As the end *g* rises it carries with it the wing-valve L, opening the port *c* and allowing the steam in the end of the cylinder H to escape into the exhaust-port, thereby destroying the balance of the piston G, which is moved over by the pressure of the steam on its opposite end, carrying with it the slide-valve F, admitting steam to the back of the piston, and opening the exhaust-port on the opposite side.

The drawing shows the slide-valve after it has completed its throw, and at the instant the piston, having finished its stroke, commences to return.

As soon as the piston clears the inclined part of the bar N, the bar and valve drop by their own weight, closing the port *c*, and restoring the balance of the piston G. The operation of both the valves L L is the same. P P are bolts projecting into the cylinder H for handling the valve when starting the engine.

I am aware that the double-headed piston, for operating the slide-valve, in connection with auxiliary valves, is not new, but such auxiliary valves have heretofore rested on their sides, their movement being in the same direction as the piston. Such valves, by reason of their construction, do not wear equally and seat themselves, but wear altogether on the lower side, and, therefore, need constant attention, while the valves above described seat themselves.

What I claim as my invention, and desire to secure by Letters Patent of the United States, is—

The auxiliary valves L L, lifting at right angles to the motion of the piston, and the bars N N, constructed as described, for unseating the valves L L, operated by contact with the piston B, in combination with direct-acting steam-engines, as and for the purpose described.

CHAS. ROGERS.

Witnesses:

W. GIBSON MILLER,

ANDREW HUMBERT.