G. C. TIMPE.

Improvement in Valves for Steam-Engines.

No. 132,781. Patented Nov. 5, 1872.

Fig. 1.

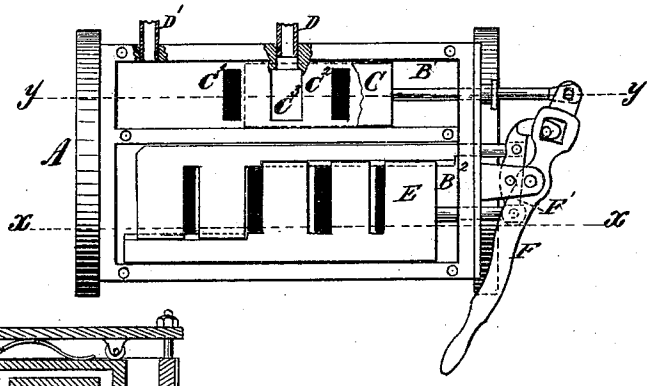


Fig. 7.

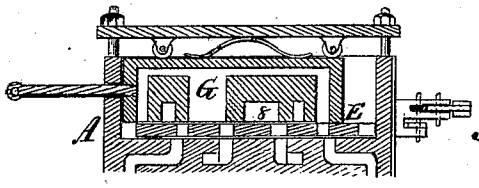


Fig. 2.

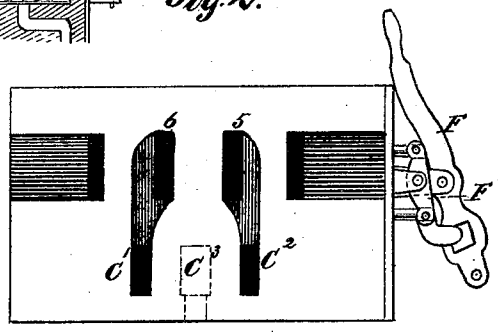


Fig. 3

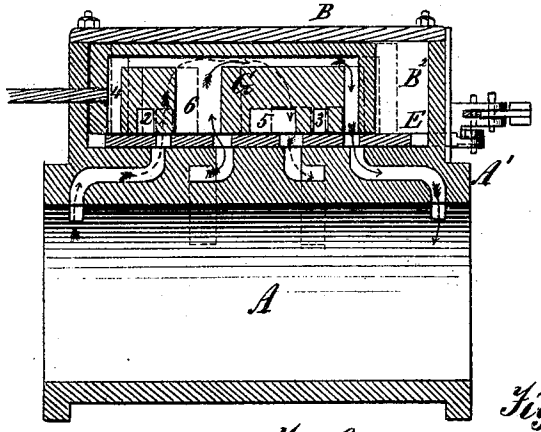


Fig. 4.

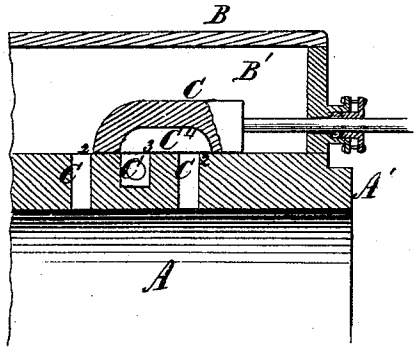


Fig. 6.

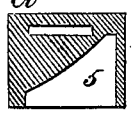
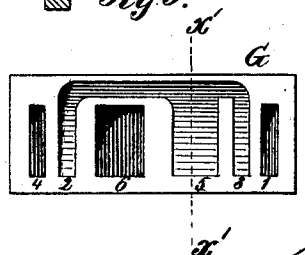


Fig. 5.



Witnesses.

A. Ruppert.

J. W. Meier

Inventor.

Gustavus C. Timpe

Edson Brothers

Attorneys

UNITED STATES PATENT OFFICE.

GUSTAVUS C. TIMPE, OF NEW ORLEANS, LOUISIANA.

IMPROVEMENT IN VALVES FOR STEAM-ENGINES.

Specification forming part of Letters Patent No. **132,781**, dated November 5, 1872.

To all whom it may concern:

Be it known that I, GUSTAVUS C. TIMPE, of New Orleans, parish of Orleans, and State of Louisiana, have invented certain Improvements in Valves for Steam-Engines, of which the following is a specification:

Figure 1 is a plan or top view of a steam-engine cylinder, showing the valves for reversing the motion of the piston, the lever by which such valves are moved, and the steam-ports in valve-seats; Fig. 2 is a plan view of the under side of the induction-valve seat, showing the induction and eduction steam-ports; Fig. 3 is a vertical longitudinal section on line *x x* of Fig. 1 of a cylinder having upon it a seat adapted to my improved valves, and showing the main valve with its reversible seat and the steam-chest; Fig. 4 is a similar section on line *y y* of the same figure, showing the valve which admits steam to the main chest, and which, in conjunction with the reversible seat, reverses the movements of the piston; Fig. 5 is a longitudinal sectional elevation of the main or eduction and induction valve, showing its ports for the induction and eduction of steam; Fig. 6 is a transverse section on line *x' x'* of Fig. 5, showing the exhaust-passages; and Fig. 7 is a sectional elevation, showing how the main valve may be used without a steam-chest, if desired.

Identical parts in the several figures are designated by corresponding letters.

This invention relates to the valves of steam and other engines; and it consists of the construction of such valves, and in certain combinations and arrangements thereof with and with reference to a reversible seat and to the openings therein, whereby the movements of the piston of the engine may be reversed at pleasure without the aid of eccentrics, arms, or any extra mechanism, except a single lever and its constructions.

In adapting my improved valves to use I use any approved form of cylinder, A, which has upon it two separate and distinct valve-seats with ports arranged to accommodate the reversing valve, and the reversible seat of the main or induction and eduction valve. That portion of this cylinder through which its induction and eduction passages are formed is raised above the general surface of said cylinder, as shown at A', Figs. 3 and 4. Cast in one piece with or attached to this raised portion of the cylinder there is a steam-chest, B, which is divided longitudinally into two compartments, B^1 and B^2, as shown in Fig. 1, in the smaller one, B^1, of which there is placed a valve, C, having in its lower surface an exhaust cavity, C^4, shown clearly in Fig. 4, through which the steam passes to the eduction-pipe D, whether the valve C is in the position shown in Fig. 1 or is thrown to the opposite end of its range of movement, the steam being admitted to this apartment of the chest through the induction-pipe D'. In the valve-seat of this compartment of the chest there are three ports, C^1, C^2, and C^3, C^1 and C^2 being induction-ports, and C^3 being an eduction-port, and the construction of the valve C and its arrangement with reference to the ports is such that when the valve is in the position shown in Fig. 1 steam or any other motive agent which may be employed will enter the port C^1 and pass from it to main valve through ports soon to be described. Underneath the main valve there is placed upon the valve-seat of the cylinder an adjustable seat-valve, E, which, when moved to the proper position, operates as a cut-off as well as a seat for said valve, the ports in this valve being so arranged as to register with the ports in said main valve and in the seat upon the cylinder. It will be noticed that the seat-valve E is made in two sections, its form being shown in Fig. 1, the object being to enable the operator to change the ports at either end, so as to cause them to act as a cut-off while the steam is being admitted at either end. The movement of the sections of the valve is effected by means of the lever F, which is pivoted to the steam-chest and to a supplemental lever, F', which has a fulcrum in that of the lever F, and is so arranged with reference thereto that, upon moving said lever F to reverse the movements of the piston by changing the position of the induction or reversing-valve C, the section of the valve E, which, for the time being is admitting steam to the main valve, will be brought into position to cause the steam to be cut off at the proper point, such point depending upon the amount of movement imparted to the seat-valve E by the rods which extend from the lever F' through a stuffing-box in the end of the steam-chest for the purpose. The

main or induction valve G is of peculiar construction, as will be seen by referring to Figs. 3, 5, and 6, where it will be seen that it has a series of openings, 1, 2, 3, 4, 5, and 6; and, supposing the lever F to be in the position shown in Fig. 1, the port C^1 will be the induction-port, from which steam will enter from the small compartment of the chest and pass through port C up into the passage in the upper portion of the valve to and through port 1, and from thence to the opposite end of the cylinder, as shown by the full arrows in Fig. 3, at which time steam will be exhausting through ports 2 and 5, and out through ports C^2 and C^3 of valve C to the exhaust-pipe D, when, if the position of valve G is changed by its moving mechanism so as to admit steam to the opposite end of the cylinder through port 4, the steam which first entered will be exhausted through ports 1 and 5 into ports C^2 and C and exhaust-pipe D, and so on alternately as the position of the main valve is changed, the position of the parts in the seat-valve E determining the amount of steam admitted to the cylinder at each stroke of the piston.

When it is desirable to reverse the movements of the piston so as to cause the engine to run in an opposite direction, the outer end of the lever F is to be moved outward or away from the steam-chest, so as to cause the valve C to cover the opening C^1 and open the port C^2, which will reverse the direction of the steam, and cause the ports, which before were induction-ports, to become eduction-ports, and vice versa, and at the same time will change the ports in the seat-valve so as to cause to cut off at the proper point under the changed condition of induction-ports.

I have shown in the drawing (Fig. 7) a modification of the chest by which I am enabled to use an open chest, or to use my improved main valve without a closed chest, if it should become desirable. It will be seen that the steam does not come in contact with any portion of valve G, except its under surface, and hence it is not necessary that it should be inclosed, the only requirement being that a bar of metal should be placed above the valve, so that rollers or a spring may be used to hold the valve down, as shown in the figure last referred to.

Having thus described my invention, what I claim, and desire to secure by Letters Patent, is—

1. The main or induction and eduction valve G of a steam-engine, constructed substantially as set forth and shown, whereby its ports may be used both as induction and eduction ports alternately for the purpose specified.

2. In combination with a steam-engine, an induction or throttle valve, C, arranged substantially as shown and described, whereby the movements of the piston of the engine may be reversed, or the steam excluded entirely from the engine, for the purpose specified.

3. The combination and arrangement of the valves C and G, levers F F′, and the seat-valve E, it being substantially such as is described, and for the purpose set forth.

4. The combination of the induction and eduction valve G, and the adjustable seat-valve E, constructed and arranged substantially as and for the purpose specified.

In testimony whereof I have hereunto signed my name this 20th day of May, A. D. 1872, in presence of two subscribing witnesses.

GUSTAVUS C. TIMPE.

Witnesses:
J. F. LEHRMANN,
C. TIMPE.