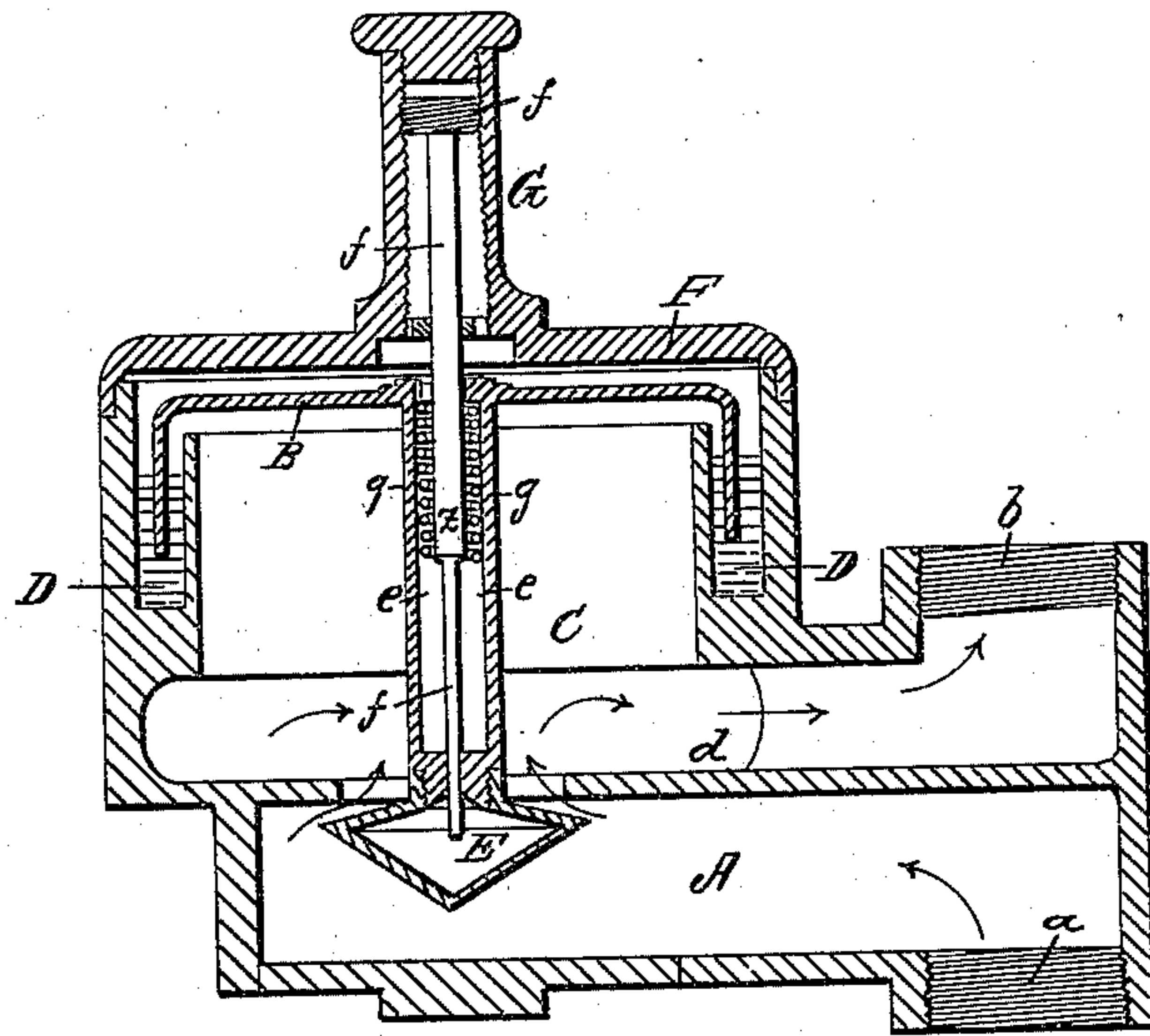


C. F. HOLZER.

Gas Regulator.

No. 21,048.

Patented July 27, 1858.



UNITED STATES PATENT OFFICE.

CHAS. F. HOLZER, OF PHILADELPHIA, PENNSYLVANIA, ASSIGNOR TO WM. B. SMITH AND WM. BROMWELL, OF SAME PLACE.

GAS-REGULATOR.

Specification of Letters Patent No. 21,048, dated July 27, 1858.

To all whom it may concern:

Be it known that I, CHAS. F. HOLZER, of Philadelphia, county of Philadelphia, in the State of Pennsylvania, have invented certain new and useful Improvements in Gas-Regulators; and I do hereby declare that the following is a full and exact description thereof, reference being had to the accompanying drawings and to the letters of reference marked thereon.

This invention relates to that description of gas regulator which has the regulating valve attached to a cup which is inverted in a basin of mercury and which is subjected to the pressure of the gas in one direction and to that of a spring in the opposite direction in such a manner as causes the area of opening of the valve to be inversely as the pressure of the gas.

It consists in certain arrangements of the working parts and of the passages as hereinafter described, by which the spring and the guide for the valve and cup are protected from the injurious effects of exposure to the gas, and provision is made for the return through the inlet opening of the regulator of water, tar, or other foreign substance that may be condensed from the gas, thus obviating the necessity of a siphon or waste receptacle attached to the regulator.

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

A, is the inlet chamber to which the inlet pipe admitting the gas at the street pressure is connected at *a*, said chamber being immediately below the outlet chamber C, from which the gas escapes at the regulated pressure by a pipe connected at *p*. The upper part of the inlet chamber is surrounded by an annular basin D to contain the mercury, in which floats the inverted cup B, which forms the cover of the principal portion of the outlet chamber.

E, is the regulating valve, whose seat is in the partition *d*, between the inlet and outlet chambers, A and C, said valve being attached by a hollow stem *e*, to the inverted cup B, which is above it, and closing or contracting the passage between it and its seat by an upward movement.

F is a cover screwing on the top of the mercury basin D, and inclosing the inverted cup B, said cover having an internally screwed socket G, extending upward from

its center, into which socket screws the head *f*¹ of a rod *f*, which passes through the center of the hollow stem *e*, and serves as a guide to the inverted cup and regulating valve.

g, is a spiral spring contained in the hollow stem *e* and surrounding the guide rod *f*, said spring being attached at its upper end to the inverted cup, and having its lower end contracted to give it a bearing under a shoulder Q, on the rod *f*, and exerting a tendency to pull down the cup and open the regulating valve, in opposition to the pressure of the incoming gas, which pressing on the under side of the cup tends to raise it and close the regulating valve.

The gas flows in the direction of the arrows shown in the drawing, and according as there is a tendency to increased or diminished pressure in the outlet chamber C, owing in the first case to an increased street pressure or the reduction in the number of burners used, or in the opening of the same, and in the latter case to a diminished street pressure or an increase of the number of burners used, or in the degree of opening of the same, the cup is more or less elevated and the opening of the valve contracted or enlarged to equalize the pressure. The pressure may be increased or diminished at pleasure by screwing the head *f*¹ of the rod *f*, lower down or higher up the socket G, to increase or diminish the tension of the spring *g*. This operation, however, is not substantially different from that of other gas regulators; but by the arrangement of the parts some important advantages are gained, which will now be explained.

It will be seen by reference to the drawing that the cup being placed above the valve and forming a cover to the outlet chamber, and the spring being placed within the hollow stem by which the valve is attached below the inverted cup, and the guide rod entering the stem through the top of the cup, both the spring and the guide rod are entirely out of contact with the gas and hence not liable to be corroded as they speedily are in other regulators, in which the springs shortly become useless. The arrangement of the cup, the valve and the inlet and outlet chambers, it will also be obvious on reference to the drawings, admits of a free return of all liquid matter condensed from the gas, through the inlet pipe,

as there is no place within the regulator where any liquid can lodge, and hence the necessity of a siphon or waste receiver to draw off such fluids periodically is obviated.

5 I do not claim the combination of an inlet and outlet chamber, a valve, an inverted cup, and a spring, as I am aware that such combination is used in most gas regulators; but

10 Having fully described the construction and operation of my improvement what I claim as new and desire to secure by Letters Patent is:—

The peculiar arrangement as described of the inlet and outlet chambers, the valve, the

inverted cup, the spring and the guide pin; 15 whereby the spring and the guide are effectually protected from contact with the gas, and provision is made for the return of all liquid matter through the inlet pipe, as herein fully set forth. 20

In testimony whereof I have hereunto set my hand and seal this nineteenth day of April, 1858.

CHAS. F. HOLZER. [L.S.]

Witnesses:

WILLIAM B. SMITH,
THOMAS Y. MIDLEN.