C. HOFFMANN.

Gas-Stove.

No. 220,838. **Patented Oct. 21, 1879.**

Fig. 1.

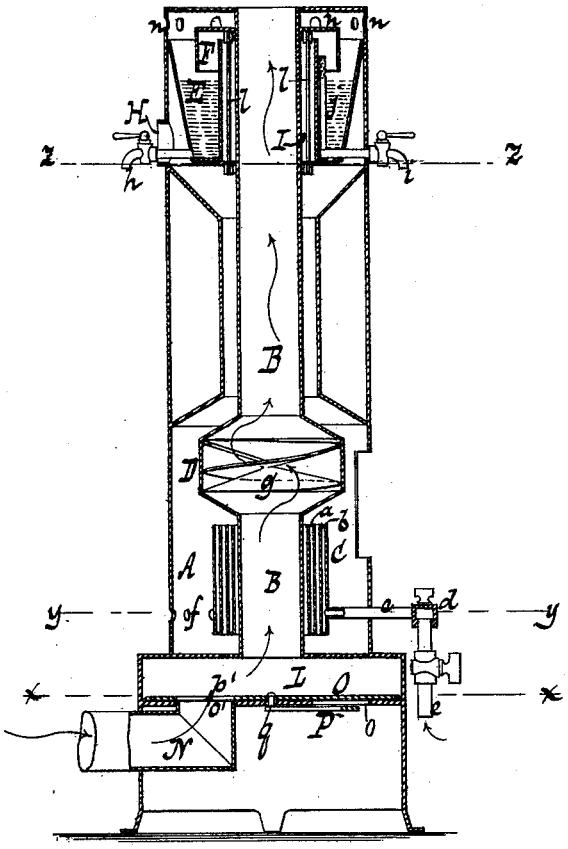


Fig. 2.

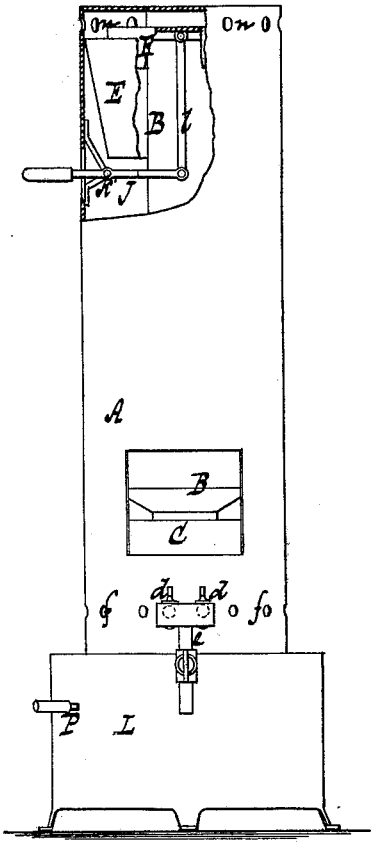


Fig. 3.

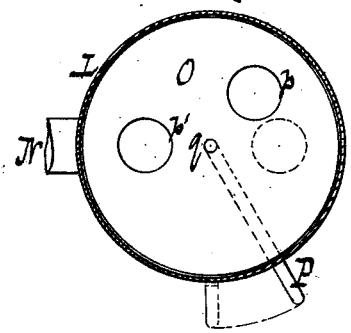


Fig. 5.

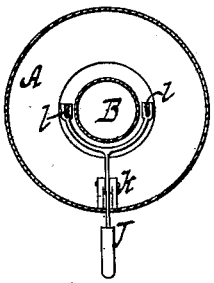
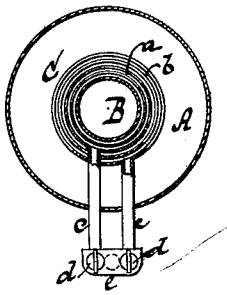


Fig. 4.



Witnesses
Otto Sutfeland
William Miller.

Inventor
Charles Hoffmann
by Van Santvoord & Lauff
his attorneys

UNITED STATES PATENT OFFICE

CHARLES HOFFMANN, OF NEW YORK, N. Y.

IMPROVEMENT IN GAS-STOVES.

Specification forming part of Letters Patent No. **220,838**, dated October 21, 1879; application filed September 4, 1879.

To all whom it may concern:

Be it known that I, CHARLES HOFFMANN, of the city, county, and State of New York, have invented a new and useful Improvement in Gas-Stoves, which improvement is fully set forth in the following specification, reference being had to the accompanying drawings, in which—

Figure 1 represents a vertical central section of a stove embracing my invention. Fig. 2 is a side view thereof, partly in section. Fig. 3 is a horizontal section in the plane *x x*, Fig. 1. Fig. 4 is a like section in the plane *y y*. Fig. 5 is a like section in the plane *z z*.

Similar letters indicate corresponding parts.

My invention relates especially to gas-stoves for heating purposes; and it consists in the combination of a combustion-chamber, a central air-heating flue, a gas-burner, consisting of two or more jackets surrounding the air-heating flue in the lower part of the combustion-chamber, and gas-supply pipes, one to each of the jackets, so that the heat of the gas-flame ascends in the combustion-chamber and acts upon the air-heating flue, while the flame can be enlarged or reduced by supplying gas to one or both jackets of the burner. In the air-heating flue, immediately above the gas-burner, is a gallery, and in this gallery is a division for retarding the circulation of air, thereby increasing the effect of the gas-flame. Into the upper part of the combustion-chamber is fitted a water-jacket, and above this jacket is a cap, which slid s on the air-heating flue, and is adapted to be set, by appropriate mechanism, while a smoke-pipe projects from the combustion-chamber below the top of the water-jacket, so that the products of combustion may be permitted to escape either at the top of the combustion-chamber or through the smoke-pipe. Air is supplied to the air-heating flue through an air-receiver, which has two holes, one for admitting inside or apartment air, and the other for admitting outside air from an air-supply pipe, and a register is used to open and close either of the holes. By combining the water-jacket and concomitants with the peculiar air-receiver, fresh air may be supplied to an apartment, while the inside or apartment air may be carried off with the products of combustion, whereby the apartment is ventilated in an effective manner.

In the drawings, the letter A designates the combustion-chamber; B, the central air-heating flue, and C the gas-burner. This burner is situated in the lower part of the combustion-chamber A, and is constructed of two jackets, *a b*, surrounding the air-heating flue B, both jackets being closed at the bottom and open at the top, and an air-space being left between them, as well as between the inner jacket and the flue, as shown.

The letter *c* designates the gas-supply pipes. These pipes are, respectively, connected to the jackets *a b*, and extend through the side of the combustion-chamber A, each pipe being provided with a stop-cock, *d*, and being connected to a feed-pipe, *e*. By this arrangement gas can readily be supplied to either or both jackets of the burner C, whence it ascends in the combustion-chamber, thereby heating the central flue. Air is admitted to the lower part of the combustion-chamber, to support the flame of the burner C, through holes *f*.

The letter D designates the gallery in the air-heating flue B, and *g* is a division in this gallery. The position of the gallery D is immediately above the gas-burner C, and the division *g*, in this example, runs in a spiral direction. By this gallery D and its division, the effect of the gas-flame upon the air circulating in the air-heating-flue B is manifestly increased, the gallery being subjected to the direct action of the flame, while the flow of air is retarded at that point.

The letter E designates the water-jacket fitted into the upper part of the combustion-chamber; F, the cap sliding on the air-heating flue B, above such jacket, and H the smoke-pipe projecting from the combustion-chamber A below the top of the jacket. The jacket E is so constructed that a space, I, is left between it and the air-heating flue B, and it is provided with two faucets, *h i*, one of which connects with a vertical pipe, *j*, perforated near the top.

Water or other liquid may be forced into the jacket E through either or both of the faucets *h i*, and the pipe *j* serves to determine the level of the liquid therein.

The cap F is fitted on the air-heating flue B, and, in this example, is raised and lowered by means of a forked lever, J, which has its fulcrum at *k*, and is connected to the cap by means of rods *l*. In the smoke-pipe H is a damper.

If the cap F is raised, as shown, the products of combustion ascending in the combustion-chamber A pass up through the space I, and under the cap, whence they escape at the top of the chamber, the latter being perforated for this purpose, as at *n;* but if the cap is lowered a sufficient distance to dip into the water in the jacket E, such products are thereby checked, and caused to pass off through the smoke-pipe H.

The letter L designates the air-receiver supplying air to the heating-flue B. This receiver constitutes a support for the wall of the combustion-chamber A, and the air-heating flue B rises therefrom, as shown.

In the bottom of the air-receiver L are two holes, *o o'*, one of which connects with a pipe, N, intended to communicate with the outer air, and upon this bottom is a register, O, consisting of a plate which has holes *p p'*, corresponding to the holes in the bottom, and which is secured to a pivot, *q*, having a handle, P, for turning the same. The function of this register O is to open and close either hole, *o* or *o'*, of the air-receiver.

By opening the hole *o* air is admitted to the receiver L, and thence to the heating-pipe B, from the apartment in which the stove is located, while by opening the hole *o'*, outside or fresh air is admitted.

If the fresh-air-supply hole *o'* is opened, and the cap F is lowered to close the top of the combustion-chamber A, a simultaneous supply and discharge of air to and from the apartment take place, the fresh air flowing in through the heating-flue B, while the apartment-air escapes with the products of combustion.

It is obvious that in this manner the apartment is effectively ventilated.

Heretofore a gas-burning stove has been provided with a central air-heating flue, communicating at its lower and upper ends with the external atmosphere, and having a gas-burner arranged within the combustion-chamber, and such, broadly, I hereby disclaim.

What I claim as new, and desire to secure by Letters Patent, is—

1. In a gas-burning stove, the combination of an air-receiving chamber, an air-supply pipe leading from the same through the casing to the external atmosphere, a register, as described, for controlling the admission of air through said pipe, a combustion-chamber arranged above, and separated from the air-receiving chamber, a vertical air-heating flue, having its lower end opening into said receiver, a gallery in the air-heating flue provided with a tortuous passage, and a gas-burner arranged within the combustion-chamber, and directly beneath the gallery, the whole being constructed and arranged substantially as shown, for the purpose described.

2. In a gas-stove, the combination, with a combustion-chamber and a central air-heating flue, of a water-jacket fitted into the upper part of the combustion-chamber, a cap sliding on the air-heating flue above the water-jacket, mechanism for setting the cap, and a smoke-pipe projecting from the combustion-chamber, below the top of the water-jacket, all constructed and adapted to operate substantially as described.

3. The combination of the air-receiver L and its two holes, the register O, air-heating flue B, combustion-chamber A, water-jacket E, cap F, and smoke-pipe H, all constructed and adapted to operate substantially as described.

In testimony that I claim the foregoing I have hereunto set my hand and seal this 29th day of August, 1879.

CHAS. HOFFMANN. [L. S.]

Witnesses:

W. HAUFF,

E. F. KASTENHUBER.