

(No Model.)

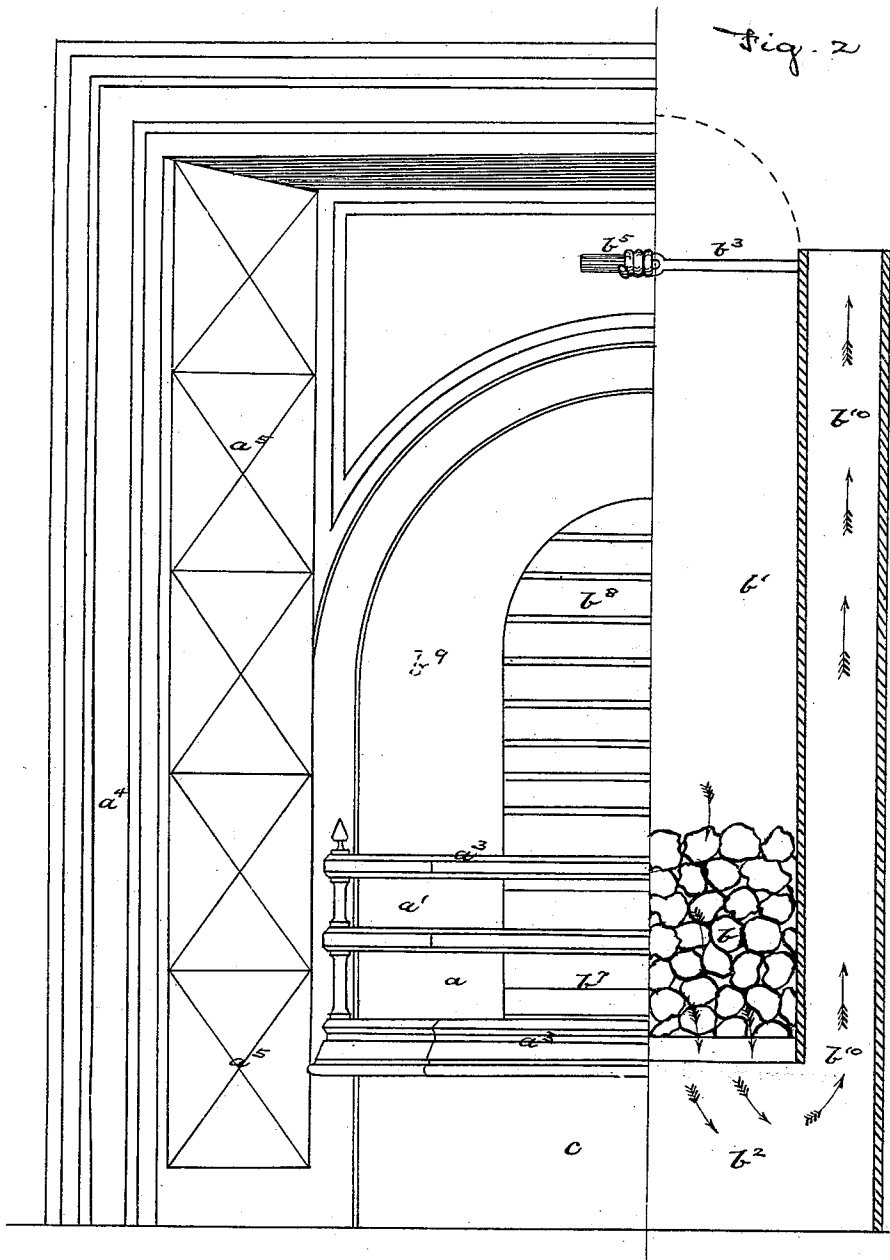
3 Sheets—Sheet 2.

S. REEVE.

FIRE PLACE AND HEATING STOVE.

No. 330,516.

Patented Nov. 17, 1885.



Witnesses:

Cory White
M. Jones

Inventor:

Samuel Reeve
By *John J. Halsted* for
his Attys

(No Model.)

3 Sheets—Sheet 3.

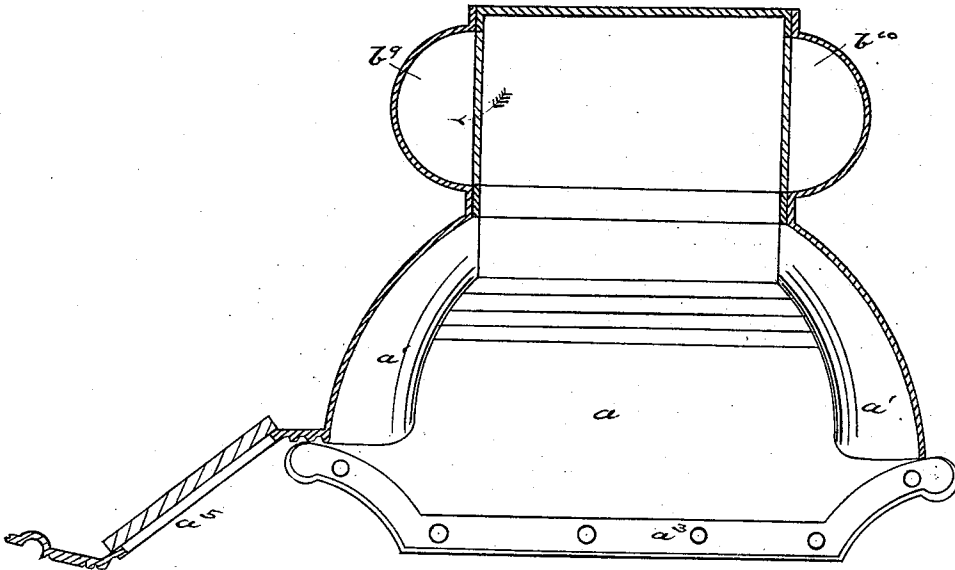
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Fig. 3



Witnesses:

Cercy White
W. E. Evans

Inventor:

Samuel Reeve
By John J. Malstead & son
his Atty.

UNITED STATES PATENT OFFICE.

SAMUEL REEVE, OF LITTLE MARYLEBONE STREET, COUNTY OF MIDDLESEX,
ENGLAND.

FIRE-PLACE AND HEATING-STOVE.

SPECIFICATION forming part of Letters Patent No. 330,516, dated November 17, 1885.

Application filed November 13, 1884. Serial No. 147,884. (No model.) Patented in England January 7, 1884, No. 887; in France October 6, 1884, No. 164,627, and in Belgium October 6, 1884, No. 66,513.

To all whom it may concern:

Be it known that I, SAMUEL REEVE, builder, a subject of the Queen of Great Britain and Ireland, residing at Little Marylebone Street, in the county of Middlesex, England, have invented certain new and useful Improvements in Fire-Places and Heating-Stoves, (applications for patent in Great Britain made January 7, 1884, No. 887, and in France and Belgium made, respectively, on October 6, 1884,) of which the following is a specification.

The object of the invention is to effect the more efficient warming and ventilating of apartments and other places with economy of the fuel employed and with the better prevention or consumption of smoke in combustion of the fuel in the fire-place.

The principal features of my invention are the fire-place, which is formed of suitable form and design for holding the fuel during combustion; a box or chamber behind the fuel-chamber, for the purpose of holding asbestos or other suitable refractory material capable of being rendered incandescent for the purpose of burning the gases or smoke passed through it; a hood or deflecting-damper capable of being adjusted in its position in the course of the flue, to intercept wholly or in part or to leave free, as desired, the passage of smoke from the fuel with the other products of combustion, and deflect them downward at will through the heated material in the said rear chamber; a channel or channels from the lower space below or behind the fire to the flue above or beyond the fire-place, for conducting them away to the air, and a channel or channels of fresh or cold air extending below or behind the fire-place. This principle of construction according to my invention admits of considerable variation in arrangement, dependent on the size of the fire-place suited to the place to be warmed and ventilated, and whether the stove already in existence is to be reconstructed or modified to my improvements or a new one substituted, or the conditions of the situation generally.

A convenient method of arrangement generally adapted to the modification of existing fire-places to my improved construction is to

remove the back of the grate and to incase the sides and bottom with fire-clay, (if not already so provided.) Then to the rear of the fuel-space I apply a body of asbestos or other refractory substance that can be maintained at a red heat, so as to close the flue-passage except by passage through that heated material, after the manner of a filter. Above the fuel-space I again close the fuel-passage by means of the damper or hood, which serves to intercept and conduct the products of combustion from the fire downward through the heated material referred to. Thence these products of combustion, rendered less noxious by their passage therethrough, pass, mixed with incoming hot air from below the fire-place, by suitable channels in the sides or other parts, to above the fire-place into the flue and pass away. The asbestos, or its equivalent, is retained in position by means of a grating or open-work division or divisions. This asbestos mass prevents the heat passing away up the flue or chimney, and causes the heat of the burning fuel to be radiated back into the chamber or room. On first lighting the fuel and until sufficiently alight the intercepting hood or damper may be drawn or pushed from over the fuel-passage, so as to give direct upward vent to the products of combustion, and be afterward replaced partially and then entirely, as desired.

For larger-sized fire-places, and where the situation is not hampered by existing arrangements requiring to be utilized, I find it convenient to somewhat modify the foregoing construction, so as to bring the burning fuel well forward, and I arrange the intercepting-hood or hollow chamber or channel so as to return the ascending products of combustion behind the fire-place and through the mass of incandescent material—such as asbestos—located in rear of the fuel to the hottest portion of the burning fuel below, and thence to cause the resultant purified gases to flow by a suitable channel to a chamber below, where, mixing with air supplied from without, those gases pass by side or inclosed channels to the flue above or beyond the fire-place, for delivery into the atmosphere deprived of their noxious

particles. The intercepting-hood or deflecting-damper is removable for facilitating first lighting of the fuel.

For smaller arrangements of heating and ventilating apparatus, it is convenient in some cases to modify the construction according to my invention by forming the hood or deflecting removable part above the fire in a somewhat simpler manner, and yet to insure the products of combustion passing downward through a similar mass of incandescent matter in rear of the fire to, below, and past the hottest part of the burning fuel, whence, mixing with air supplied by a suitable inlet, the resultant gases pass by a channel or channels up the sides or back of the grate, stove, or fire-place to the flue, for dispersal into the atmosphere. Suitable curved or other shaped plates in either arrangement may be applied to assist the proper conduction of the currents of air, gas, or products of combustion. The surrounding parts most exposed to heat should be formed of fire-clay or fire-brick material. The upper front portion of the hood or intercepting and deflecting damper should in some cases, where much exposed to direct heat, be lined or coated with asbestos or other suitable non-conducting material. Suitable guards or baffle-plates are employed when desirable to prevent the entrance of undesirable matter into the air-channels or gas-passages and to promote circulation. It will be found one of many advantages of this plan of construction that it lends itself with great facility to various descriptions of ornamentation and diversity of forms of design. Warmed air may be supplied to the chamber to be heated and ventilation promoted by means of openings at the sides of the stove or fire-place by which air can pass to be warmed by the heated channels referred to, and when warmed to flow into the chamber; but that the nature of the invention may be the better understood, I will proceed by the aid of the accompanying drawings to describe the same more in detail.

In the drawings, Figure 1 shows by a sectional view, Fig. 2 by a front view, partly in section, and Fig. 3 by a plan view, an arrangement of stove or fire-place and parts adapted for carrying my invention into effect, either when the conditions of the situation are suitable or the space has been adapted specially for the purpose in an apartment.

a indicates the space for the reception of the fuel to be burned, and of which a' a' are the side cheeks or walls, and a^2 the bottom, all formed of fire-clay.

a^3 are the front bars.

a^4 indicates the front of the stove, facing into the apartment.

a^5 a^5 indicate a space available for tile or other decoration, as is well understood.

b is a chamber or space behind the flue-space, filled with asbestos or suitably refractory heat-resisting material maintainable in a highly-heated condition, which material closes the flue-passage through b , except through the

interstices of its own substance, so that gases passing from b' above to b^2 below that mass in the direction of the arrows pass there-through as through a filter. The flue-space b' is again closed above at b^3 by a hood or closing-plate, which serves to intercept the gases and products of the combustion of the fuel in a and deflect them wholly or in part, causing them to pass through b . The closing-plate at b^3 can be operated by a rod, b^4 , and handle b^5 , so as to be turned or removed to open that passage b' direct to the flue b^6 upward, as occasion may render desirable, and especially for a short period upon first lighting the fuel.

b^7 b^8 are louvers or open partitions, respectively dividing the fuel from the asbestos and the upper part of the fire-place from the flue-space b' , but affording ready passage to the gases and smoke.

c indicates a space which may, if desired, be utilized to receive a pan to catch ashes from a , in which case the fuel-space or fire-pot a should be provided with an open-work bottom. The division-plate b^* , dividing the space b^2 from c , may be applied farther to the front to enlarge that chamber or space b^2 accordingly. The under space, b^2 , communicates with b^9 b^{10} , arranged one on each side of the central flue, b' , or one on one side only may be used, which in turn communicate with the flue-space b^6 to carry off the filtered products of combustion.

d d are perforations in the plates or walls of the fire-place dome and back for the escape of such smoke as may ascend beyond the openings in the partition b^8 . b^{11} are bars to support the asbestos.

It will be observed that the passage b' , when closed by the plate or hood b^3 , communicates with the flue or flues b^9 or b^{10} by way of the under space, b^2 , only at the bottoms of these flues, and therefore that in this condition the passage b' becomes a chamber, closed at top, but open at its bottom, which supports the asbestos or equivalent material. This passage or chamber thus in conjunction with b^9 or b^{10} becomes a siphon, and the products of combustion cannot rise and escape until they shall have first passed down and up through this siphon, and in so doing must of necessity pass through the whole mass of heated asbestos or equivalent material, and get the completest filtering attainable.

Prominent among the many advantages arising from this improved arrangement or construction of stove or fire-place and fuel-economizing means are, first, economy of the fuel employed; second, simplicity of construction or adaptation; third, consumption of smoke or its denser particles; fourth, prevention of accidental fires in the flues, arising from the dense deposits of carbon; and, fifth, non-liability to downblows of soot from the like causes, to the detriment of comfort and the injury of furniture and decorations.

Having now particularly described and as-

certained the nature of my said invention and in what manner the same is to be performed, I declare that what I claim is—

1. In combination with a fire place or grate
5 closed at its bottom, a chamber or flue-space at its rear, a damper in said flue-space at a point or line above the grate, and the flue having an open-work bottom to support asbestus or equivalent material, and one or
10 more passages or flues communicating with the space beneath such bottom, the combination serving to draw downward the products of combustion through the heated asbestus or equivalent and to filter them, substantially
15 as set forth.

2. In combination with the fire-place or stove and with the described siphon-like arrangement of passages b' b^2 and b^9 b^{10} , as set
20 forth, and with the grating or open-work support, a mass of asbestus or equivalent material upon the support, the adjustable hood or

closing-plate serving to close or open at will the passage b' , as and for the purposes described.

3. The combination, in a fire-place or stove 25 having a grate or fire-pot open at its front, top, and back, of an open-work support at its rear, a mass of asbestus or equivalent material upon the support, the passages b^7 and b^8 , b^9 , b^2 , and b^{10} , the latter communicating with 30 the outlet-flue, the adjustable hood or plate b^3 , and the perforated walls in the dome, substantially as and for the purposes set forth.

In testimony whereof I have hereunto set my hand in the presence of two subscribing 35 witnesses.

SAMUEL REEVE.

Witnesses:

ALFRED DONNISON,

JOHN ALFRED DONNISON,

Both of No. 71 Cornhill, London.