(No Model.)

J. H. ROBERTS.

HOT AIR GENERATOR FOR FIRE PLACES.

No. 306,178. Patented Oct. 7, 1884.

Fig. 1.

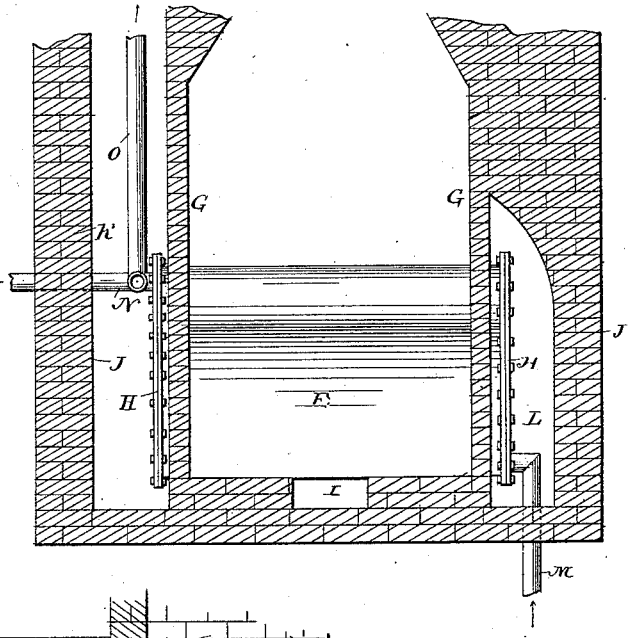


Fig. 2.

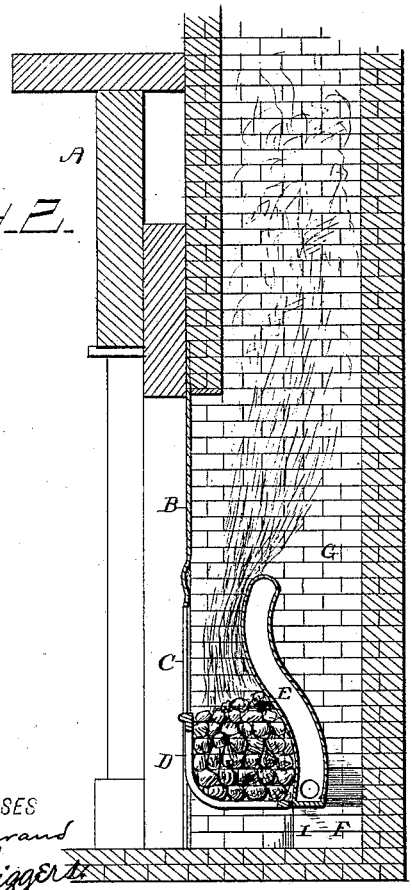
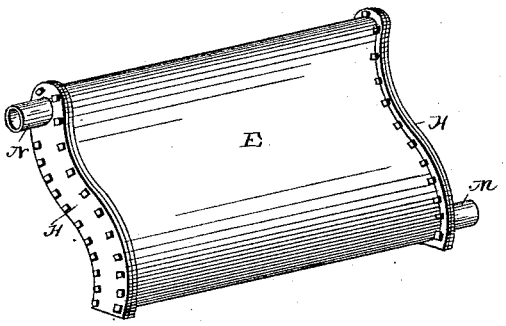


Fig. 3.



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JOSEPH H. ROBERTS, OF TORONTO, OHIO.

HOT-AIR GENERATOR FOR FIRE-PLACES.

SPECIFICATION forming part of Letters Patent No. 306,178, dated October 7, 1884.

Application filed December 26, 1883. (No model.)

To all whom it may concern:

Be it known that I, JOSEPH H. ROBERTS, a citizen of the United States, residing at Toronto, in the county of Jefferson and State of Ohio, have invented a new and useful Hot-Air Generator for Fire-Places, of which the following is a specification, reference being had to the accompanying drawings.

This invention relates to hot-air generators for fire-places; and it has for its object to utilize the wasted heat thrown out from the back of the grate to heat an upper or adjoining room of the same building. It is well known that enough heat is wasted about the back of the grate to heat another room comfortably, and to generate this heat and convey it where it will do the most good has been the main feature in this class of inventions. Various attempts have been made to attain this end; but they have either made the construction too expensive for general use, or the arrangement and construction of the parts have been defective and not practical in many particulars.

To avoid these defects, and to simplify the construction and reduce the cost of such appliances, my invention consists in certain details of construction and combination of parts as hereinafter set forth, and particularly pointed out in the claims.

In the accompanying drawings, Figure 1 is a back view of a fire-place, illustrating the adaptation of my improved generator. Fig. 2 is a vertical sectional view. Fig. 3 is a detail view of the hot-air chamber.

In the several figures the same letters refer to corresponding parts.

Referring to the drawings, A designates a mantel-piece having the usual fire-board, B, secured in position in any suitable manner, an opening, C, being formed therein to receive a grate, D.

The construction of the forgoing parts do not form the subject-matter of this application, and hence may be of any suitable design.

E designates the hot-air chamber, formed air-tight, resting at its lower end upon masonry-work F, and projecting at its upper end over the grate, the sides or ends of the chamber extending through partitions G. This hot-air chamber is formed preferably of the shape shown in the drawings, the front and back being made in one piece, having the form of a compound curve, the sides, H, being bolted or otherwise secured to the ends of the front and back. The bottom of the chamber is formed flat, so as to rest firmly upon and to be secured to the top of the masonry-work F, the latter having a central opening, I, communicating with the grate, and giving a direct draft to the same when burning bituminous coal, and also serving as a convenient opening in which to thrust a shovel to withdraw the accumulations of soot and fire-ashes dropped from the chimney.

J designates partitions of masonry-work arranged parallel with partitions G, and forming therewith pipe-chambers K L, for the hot and cold air pipes. A tube or pipe, M, extends from the lower end of chamber E, projecting into the chamber L, and either downward into the cellar or the pipe M may be arranged in any other suitable manner to gather all the cold air and distribute it into the air-tight heating-chamber E. A pipe, N, extends in a similar manner from the upper projecting end of chamber E, and across the pipe-chamber K, and into an adjoining room on the same floor, or into and around the same room, so as to heat every portion thereof. A branch pipe, O, connects with the main-pipe N and extends vertically in the pipe-chamber K, and into suitable registers in any of the rooms above.

From the foregoing description, taken in connection with the annexed drawings, the operation and advantages of my invention will be readily understood. The lower portion of the air-tight chamber E rests upon the masonry-work F on a level with the bottom of the grate, the fuel resting against or near the chamber, the upper portion of the latter, which extends over and above the grate, receiving the impact of the ascending volumes of gases and flame, so as to thoroughly and effectively heat the air contained therein. It will be seen that the arrangement of the hot and cold air tubes permit the admission of cold air at one of the lower corners of the chamber E, where it soon becomes heated and arises,

the continual admission of cold air forcing the heated air outward through the hot-air tube. Thus, as long as the fire in the grate is kept burning, the admission of cold air to the chamber, its conversion into heated air, and the escape of the latter into the adjoining or upper rooms will be continued, and thus I save the cost, trouble, and expense of fitting up another furnace in the said rooms, and heat the rooms by the wasted heat thrown out from the back of the grate.

One of the advantages attained by the construction and arrangement shown is the manner in which the air-tight chamber E is secured in place away from the back wall of the chimney. It is well known that the back wall conducts from the chamber a considerable portion of the heat generated therein, and thus impairing the degree of heat so generated. By the construction shown, I avoid this serious defect, while the stability of the same is not lessened in any manner. I also provide rooms back of the chamber to permit soot and fire-ashes to accumulate and not fall upon and injure the surface of the chamber, such as is generally the case, the soot and ashes being removed when desired by thrusting a shovel through the opening I.

It will be seen that the peculiar construction of the chamber allows the heated air and gases arising from the burning fuel to strike the same direct, and thus cause the heating of the air within. No portion of the flame and gases induced from the fuel will escape up the flue or chimney without striking the chamber, so that the latter, by its peculiar conformation, is productive of the greatest heat. Since the chamber is arranged away from the back wall of the flue or chimney, there will be no danger of the back wall conducting away from the said chamber any of its heat, and thus the efficiency of the same is rendered complete.

The pipes K L are formed of masonry-work, and extend back to the back wall of the chimney, the hot-air tube or pipe being arranged in the pipe-chamber K, and not in the chimney, as is generally the case. Thus the pipe will not be covered with soot and ashes from the chimney, and there will be no danger of smoke entering through the register and into the room, which generally results when the hot-air tube is placed in the chimney.

The pipe-chamber L allows the ready attachment of the cold-air pipe away from the chimney, so as not to be influenced thereby.

It will be seen that my construction is simple, durable, inexpensive, and efficient, the heating of the chamber E being conducted rapidly and without any loss of heat from the grate. If it should be found desirable, the front plate of the chamber E may be constructed of material that will effectively resist the action of the heat directed against it, and for this reason I do not confine myself in making the said chamber of one piece, front and back, since it may prove advisable to make the front detachable and of a stronger material than the back plate.

The parts of my improved generator are not likely to get out of order; but, for the purpose of guarding against this possible danger, I prefer to fit them together in the strongest manner, and make them of the best materials that will resist the action of heat.

In order to define the nature, advantages, and scope of the present invention, I would have it understood that I am aware of the patent to Miller, No. 48,425, June 27, 1865, and I do not claim anything shown therein. This patent employs pipe-passages on each side of the air-chamber; but the latter does not pass through the partitions separating it from the passages. Furthermore, the lower end of the chamber does not rest on masonry-work like mine. The object of passing the chamber through the partitions is to provide a better support for the same, and enable the attachment of the hot and cold air pipes. In my apparatus the partitions serve to support the ends of the chamber, but in Miller no such provision is made.

Other advantages are apparent, but these seem to be the most prominent.

Having described my invention, I claim as new—

1. In a hot-air generator for fire-places, the combination, with the fire-place, of a chamber resting at its lower end on masonry-work, and extending above the grate, partitions J J, forming hot and cold air passages K L on opposite sides of the chamber, and hot and cold air tubes extending into the hot and cold air passages and communicating with the chamber, as set forth.

2. In a hot-air generator, the combination, with the fire place, of a chamber arranged over and above the grate and extending outward from the back wall of the chimney or flue, the lower end of the chamber resting upon masonry-work, and its sides extending through partitions G, as set forth.

3. In a hot-air generator, the combination, with the fire-place, of a chamber formed in the shape of a compound curve and arranged over and above the grate and extending out from the back wall of the chimney or flue, masonry-work F, upon which the lower end of the chamber is supported, an opening, I, formed in the masonry-work, hot and cold air passages K L, arranged on each side of the chamber E, the cold-air tube M and the hot-air tube N, the latter extending across the hot-air passage, one branch leading upward into the room above and the other branch extending into the room on the same floor, as set forth.

In testimony that I claim the foregoing as my own I have hereto affixed my signature in presence of two witnesses.

JOSEPH H. ROBERTS.

Witnesses:

E. G. SIGGERS,

H. B. ZEVELY.