Nov. 30, 1926. 1,609,213

S. E. SMITH

FURNACE

Filed Oct. 21, 1925

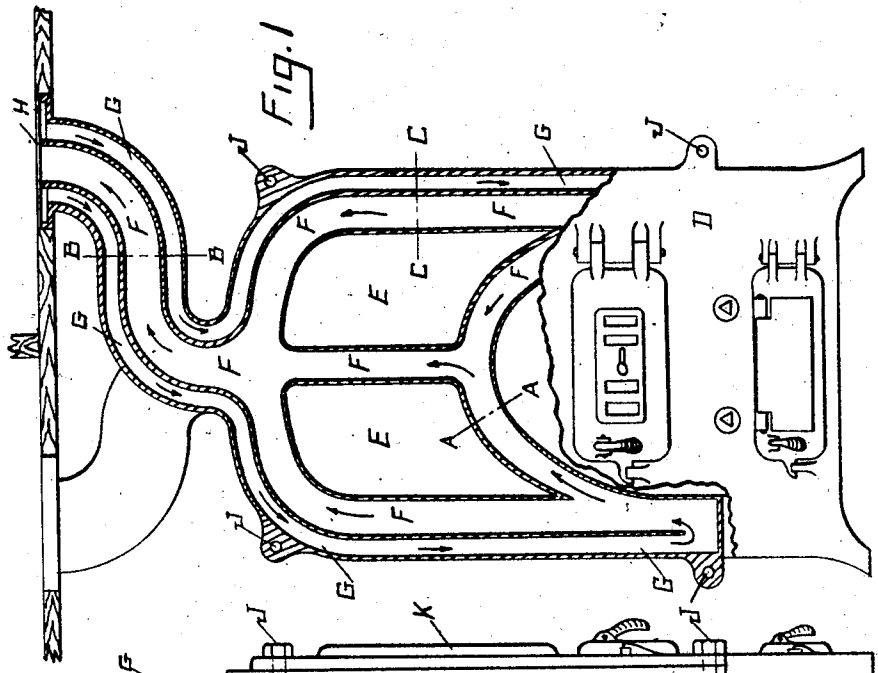

Fig. 1

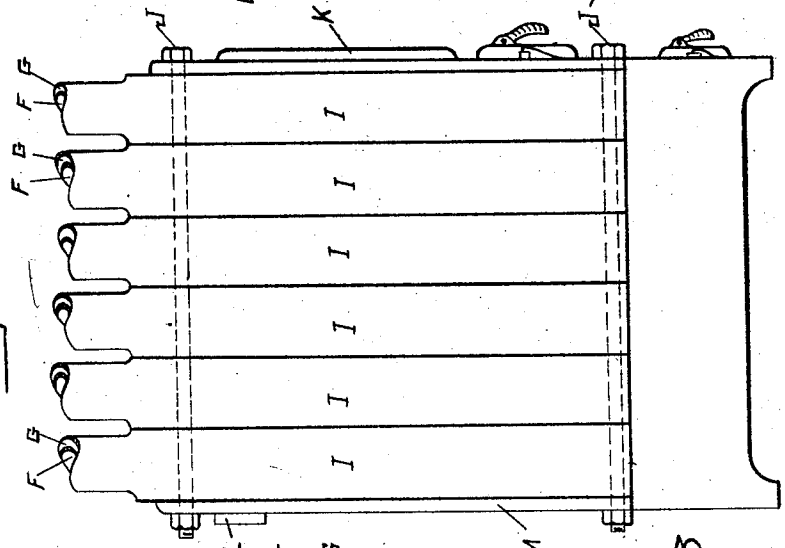

Fig. 2

Fig. 3

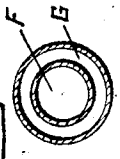

Fig. 4

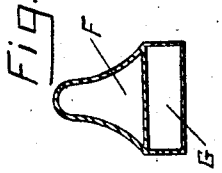

Fig. 5

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UNITED STATES PATENT OFFICE.

SILAS E. SMITH, OF LYNN, MASSACHUSETTS.

FURNACE.

Application filed October 21, 1925. Serial No. 64,028.

My invention relates to new and useful improvements in hot air furnaces, in which the number of sectional heating units may be increased or decreased to vary the heating capacity of the furnace, each heating unit constituting a closed hot and cold air conduit.

The purposes of my invention are to provide an efficient heating plant capable of greater than normal thermal efficiency and operative at minimum costs; to provide a new and novel unit construction, each heating unit constituting a closed hot and cold air conduit; to provide new and novel multiple air circulating means in combination with multiple heating units; to utilize through thermal efficiency a maximum proportion of heat from a given volume of the products of combustion; to insure a uniform distribution of heat throughout the area to be heated; to eliminate in the hot air pipes all dust originating in other than the area to be heated; to exclude from the heated area the fumes originating in the combustion chamber; and to provide the various other advantages and results apparent from the following specification:

I accomplish the objects of my invention as disclosed in the accompanying drawings, which form a part of this application and in which Figure 1 is a front view of my improved furnace, showing its top portion in sectional form. Figure 2 shows a side view. Figure 3 is a transverse section of a series of the hot air pipes on the line A—A in Figure 1 showing the construction which allows free passage of the products of combustion to the combustion chamber above. Figure 4 is a transverse section of the hot and cold air conduit on the line B—B in Figure 1. Figure 5 is a transverse section of the heating unit on the line C—C in Figure 1.

Referring again to Figure 1, D shows the front of the furnace in which are the doors to the fire box and ash pit. E shows the upper half of the combustion chamber. F shows the hot air pipes and G shows the cold air return passages, both leading to the floor register H.

Referring again to Figure 2, I shows the heating units. J shows the bolts by which the heating units are secured together. K shows the clean out door through which the air pipes are easily accessible. L shows the flanged flue outlet positioned in the back plate M, to which flue outlet a smoke pipe is attached.

Referring again to Figure 3, N shows the passages between the hot air pipes F, through which passages the products of combustion pass to the chamber E (see Figure 1).

Similar letters of reference refer to similar parts throughout the various views.

The contacting faces of the heating sections may be formed with grooves which may be cemented when assembled so as to be closely fitted and effect an air tight joint. No novelty is claimed, however, for this detail of manufacture. The base of my furnace is made in various sizes to accommodate the varying number of heating units required.

In the operation of my improved furnace the heat, smoke, gases and other products of combustion from the fire circulated through the passages N between the hot air pipes F over the fire box to the combustion chamber E formed by the several heating sections of the furnace, contact there with the surfaces or walls of the hot air passages F and then discharge through the flue to the chimney or smoke stack connected therewith. Additional hot air units may at will be connected within the combustion chamber to insure increased heating surface should this be found desirable. No cold air box is required, the cold air being taken from the area to be heated through the passages G. The hot and cold air passages being tight, all gases, smoke and dust, other than that found in the heated area, are excluded. In the manner described the advantages claimed for the so-called pipeless furnace are attained with the additional advantages of an even distribution of clean, dustless heat throughout a series of rooms.

My improved furnace, being simple in construction, is inexpensive to manufacture. The various parts are conveniently made of castings and are extremely strong and durable.

Dampers such as are ordinarily understood are utilized for the better control of the fire.

I do not confine myself to the specific details of construction herein set forth, but claim all such variations and equivalents as may well be construed to fall within the scope of the appended claims.

Having thus described my invention I

claim as new and desire to secure by Letters Patent of the United States of America:

1. A furnace comprising a fire box, a hot air chamber extending about the sides and top of the fire box and having a lead off passage to an outlet removed from the fire box, a combustion chamber extending over and above the top of the fire box and having spaced portions to permit passage of heated air between such portions from the region of the hot air chamber directly above the fire box, and a cold air passage exteriorly adjacent to the hot air chamber and lead off passage and communicating with the hot air chamber at its low point and adjacent to the sides of the fire box, the intake of said cold air passage being adjacent to the outlet of the hot air chamber lead off passage.

2. A furnace comprising a fire box having a dome shaped top, a hot air chamber extending about the sides and top of the fire box and having a lead off passage to an outlet removed from the fire box, a combustion chamber extending over and about the top of the fire box and having spaced portions to permit passage of heated air between such portions from the region of the hot air chamber directly over the apical point of the dome shaped top of the fire box, and a cold air passage exteriorly adjacent to the hot air chamber and surrounding the lead off passage and communicating with the hot air chamber at its low point and adjacent to the sides of the fire box, the intake of said cold air passage being adjacent to the outlet of the hot air chamber lead off passage.

3. A furnace formed with a plurality of similar sections adapted to be attached together to form the assembly, and each section having a chamber for forming the fire box and provided with a dome shaped top, a hot air passage extending about the sides and top of the fire box chamber and having a lead off to an outlet removed from the fire box, a chamber adapted to form the combustion chamber of the furnace extending over and above the top of the fire box chamber and having spaced portions to permit passage of heated air between such portions from the region of the hot air chamber directly over the apical point of the dome shaped top of the fire box, and a cold air passage exteriorly adjacent to the hot air chamber and surrounding the lead off passage and communicating with the hot air chamber at its low point and adjacent to the sides of the fire box chamber, and the intake of said cold air passage being adjacent to the outlet of the hot air chamber lead off passage.

4. A furnace comprising a fire box having a dome shaped top, a hot air chamber extending about the sides and top of the fire box and having a lead off passage to an outlet removed from the fire box, a combustion chamber extending over and above the top of the fire box and having spaced portions from the region of the hot air chamber directly over the apical point of the dome shaped top of the fire box, and a cold air passage exteriorly adjacent to the hot air chamber and surrounding the lead off passage and communicating with the hot air chamber at its low point and adjacent to the sides of the fire box, the intake of said cold air passage being adjacent to the outlet of the hot air chamber lead off passage, and said furnace being formed of a plurality of structurally similar sections the structural arrangement of the elements of which are symmetrical and identical on either side of a center line dividing the furnace vertically through the apical point of the dome of the fire box.

In testimony whereof I affix my signature.

SILAS E. SMITH.