R. G. SPEER.

HEATING APPARATUS.

APPLICATION FILED JULY 11, 1914.

1,137,675.

Patented Apr. 27, 1915.

2 SHEETS—SHEET 1.

Fig. 1.

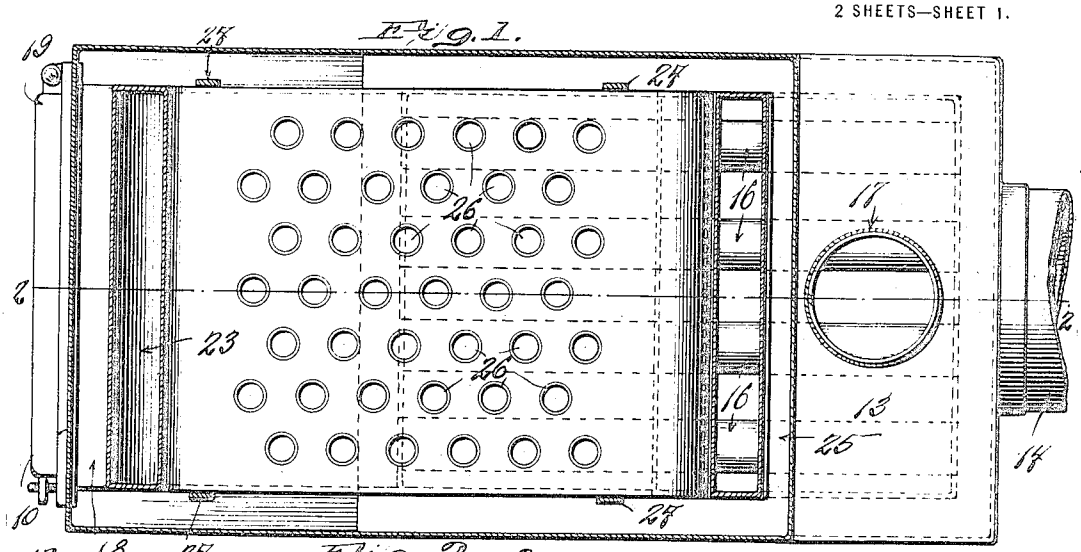
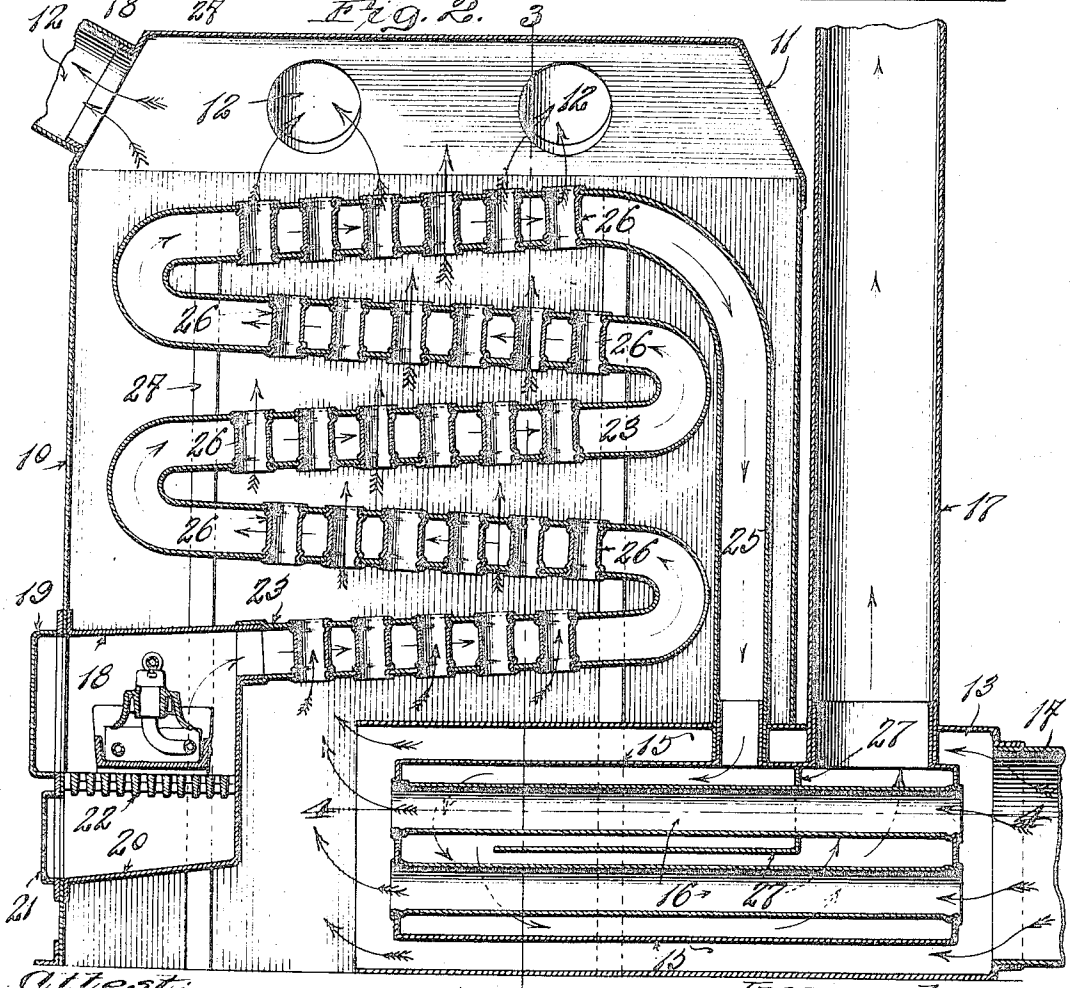


Fig. 2.



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2 SHEETS—SHEET 2.

Fig. 3.

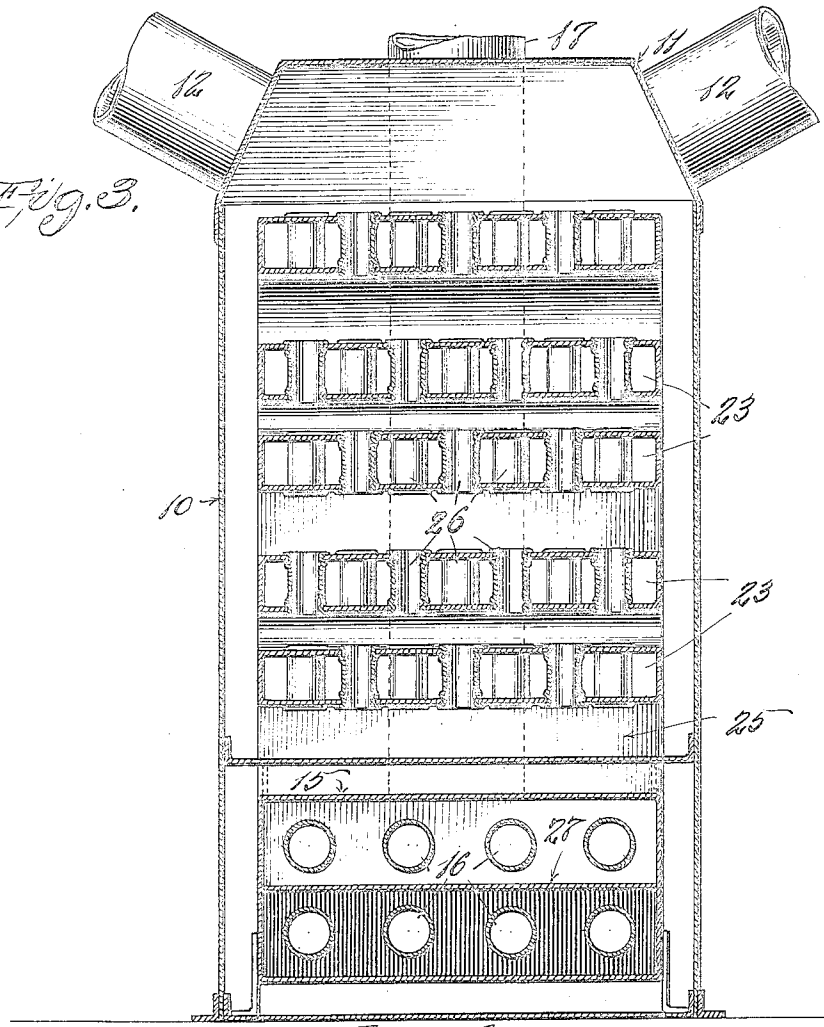
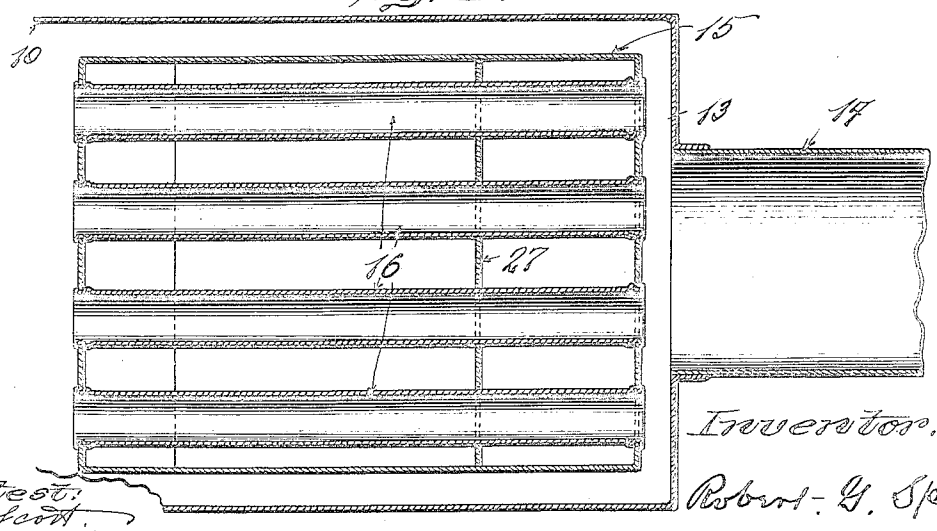


Fig. 4.



Witnesses:
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UNITED STATES PATENT OFFICE.

ROBERT G. SPEER, OF ST. LOUIS, MISSOURI.

HEATING APPARATUS.

1,137,675. Specification of Letters Patent. Patented Apr. 27, 1915.

Application filed July 11, 1914. Serial No. 850,315.

To all whom it may concern:

Be it known that I, ROBERT G. SPEER, a citizen of the United States, residing at St. Louis, Missouri, have invented a certain new and useful Improvement in Heating Apparatus, of which the following is a full, clear, and exact description, such as will enable others skilled in the art to which it appertains to make and use the same, reference being had to the accompanying drawings, forming a part of this specification.

My invention relates to certain new and useful improvements in heating apparatus, the principal object of my invention being to provide a comparatively simple inexpensive apparatus, particularly adapted for household heating purposes in which the heat and products of combustion are carried through the apparatus so as to thoroughly and effectively heat the air delivered to said apparatus without appreciable loss.

A further object of my invention is to construct a simple form of heating apparatus which is adapted to utilize oil, gas or coal as fuel.

With the foregoing and other objects in view, my invention consists in certain novel features of construction and arrangement of parts hereinafter more fully described and claimed.

In the drawings, Figure 1 is a horizontal section taken through the upper portion of a heating apparatus of my improved construction. Fig. 2 is a vertical section taken approximately on the line 2—2 of Fig. 1. Fig. 3 is a vertical section taken approximately on the line 3—3 of Fig. 2. Fig. 4 is a horizontal section taken approximately on the line 4—4 of Fig. 3.

In the construction of my improved heater, I make use of a hollow rectangular body 10, the same being preferably constructed of sheet metal and provided with a hood 11 from which leads a series of pipes 12 which are adapted to deliver heated air to various parts of the building in which the apparatus is located.

Located in the lower rear portion of the body 10 is a horizontally disposed box 13, the inner end of which is open and connected to the outer end is a fresh air inlet pipe 14. Located within this box 13 and spaced apart from the walls thereof is a smaller box 15, the ends of which are closed and seated in said closed ends are the ends of a series of horizontally disposed tubes 16, both ends of which are opened.

Leading from the rear portion of the box upwardly through the top of the box 13 is a smoke discharge pipe 17. Located in the front lower portion of the body 10 is a fire box 18 having a firing door 19 and located below this fire box is an ash pan 20 having a door 21.

A grate 22 is located between the box and ash pan, which grate is utilized when coal or wood is used as fuel in the apparatus, and when gas or oil is utilized as fuel, a suitable burner is located in the fire box.

Leading from the rear upper portion of the box 18 is a flat tube or pipe 23, the same extending in zig-zag form backward and forward to the upper end of the body 10, thereby providing a series of substantially horizontal sections which are supported by suitable uprights 24, and leading from the upper one of these sections downwardly through the rear portion of the body 10 is a pipe 25 which leads through the box 13 to the box 15 in front of the pipe 17.

Located in the horizontally disposed portions of the pipe 23 are short vertically disposed tubes 26, the same being open at both ends.

Located in the central portion of the box 15 is a horizontally disposed baffle plate or deflector 27, the rear end of which extends upwardly and unites with the top of said box at a point between the pipes 25 and 17.

When my improved heating apparatus is in service, heat from the fuel under combustion in the fire box 18 passes upwardly through pipe 23 and from the upper section thereof downwardly through pipe 25, thence forwardly through box 15, around the forward end of the baffle plate 27 therein, thence rearwardly through the lower portion of said box, and thence outwardly through pipe 17.

Fresh air entering box 13 through pipe 14 passes through said box and the pipes 16, thereby becoming initially heated to a certain degree, and said air discharging from the forward end of said box 13 into the main body of the furnace passes upwardly through pipes 26, thereby becoming heated to a comparatively high degree inasmuch as said pipes 26 are directly in the path of travel of the heat and products of combustion passing through pipe 23 and the heated

air finally discharges into and through pipes 12 which distributes the heated air to the various points within the building in which the apparatus is located.

By leading the heat and products of combustion to the box 15 and providing means for passing air through this box practically all of the heat from the fire or burner within the apparatus is utilized, and as a result, the apparatus can be very economically operated.

A heating apparatus of my improved construction is comparatively simple, can be cheaply constructed, is particularly adapted for household heating purposes and can be operated with any ordinary fuel.

It will be readily understood that minor changes in the size, form and construction of the various parts of my improved apparatus can be made and substituted for those herein shown and described, without departing from the spirit of my invention, the scope of which is set forth in the appended claims.

I claim:

1. In a heating apparatus, a housing, a fire box located therein, a box located in the rear lower portion of the housing, an air pipe leading to said box, a second box located within the first mentioned box, a zig-zag pipe leading from the fire box upwardly through the housing, and thence downwardly to the second mentioned box, and a series of short pipes located in the legs of the zig-zag pipe.

2. In a heating apparatus, a housing, a fire box located therein, a box located in the rear lower portion of the housing, an air pipe leading to said box, a second box located within the first mentioned box, a zig-zag pipe leading from the fire box upwardly through the housing and thence downwardly to the second mentioned box, a series of short pipes located in the legs of the zig-zag pipe, and a smoke pipe leading from the second mentioned box.

3. In a heating apparatus, a housing, a fire box located in the lower portion thereof, a box located in the rear lower portion thereof, a series of tubes extending through said box for conveying fresh air to the interior of the housing, a zig-zag pipe leading upwardly through the housing from the fire box, and thence downwardly to the box in the rear lower portion of said housing, and a series of air tubes seated in the legs of the zig-zag pipe.

4. In an apparatus of the class described, a housing, a fire box located therein, means within the housing for conducting the products of combustion from the fire box backwardly and forwardly and upwardly through the housing, a box located in the rear lower portion of the housing, which box receives the products of combustion after they have passed upwardly through the housing, and means for conveying fresh air through the box to initially heat said air.

5. In an apparatus of the class described, a housing, a fire box located therein, means within the housing for conducting the products of combustion from the fire box backwardly and forwardly and upwardly through the housing, a box located in the rear lower portion of the housing, which box receives the products of combustion after they have passed upwardly through the housing, means for conveying fresh air through the box to initially heat said air, and a smoke pipe leading from said box.

In testimony whereof I hereunto affix my signature in the presence of two witnesses, this 6th day of July, 1914.

ROBERT G. SPEER.

Witnesses:
WM. H. SCOTT,
A. B. LEWIS.