D. M. BOWEN.

GAS RADIATOR.

APPLICATION FILED AUG. 11, 1921.

1,413,826. Patented Apr. 25, 1922.

Fig. 1.

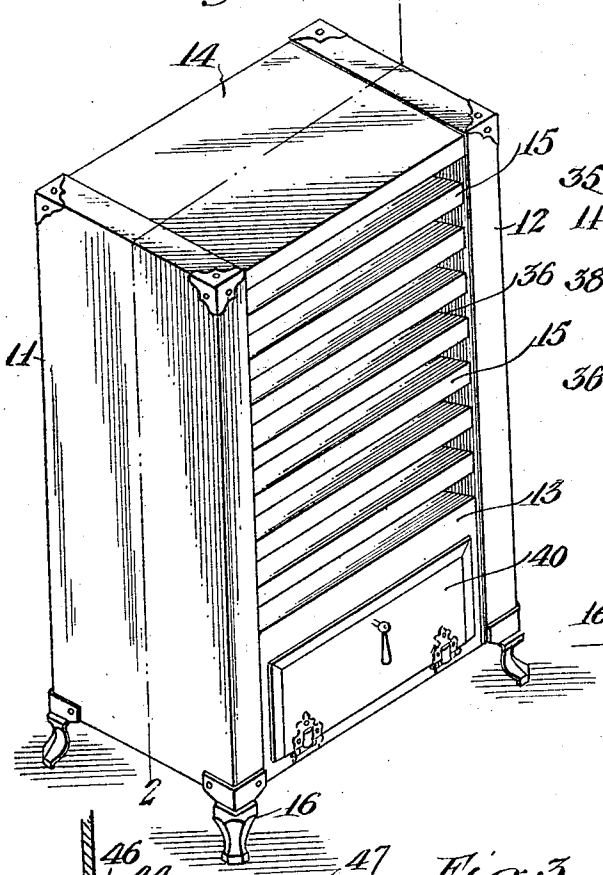


Fig. 2.

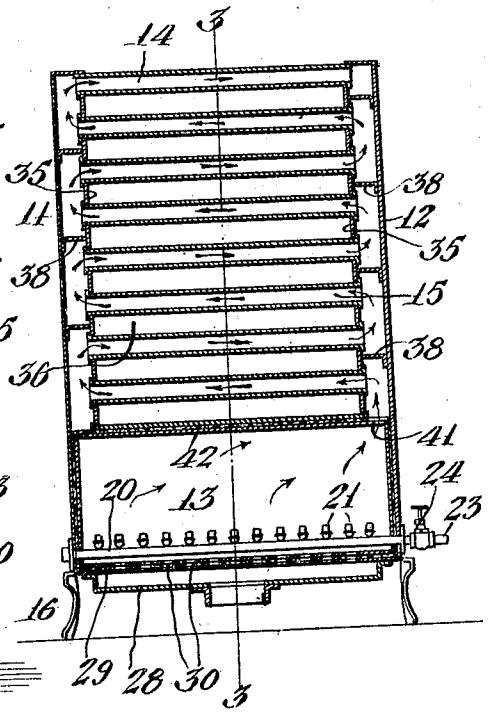
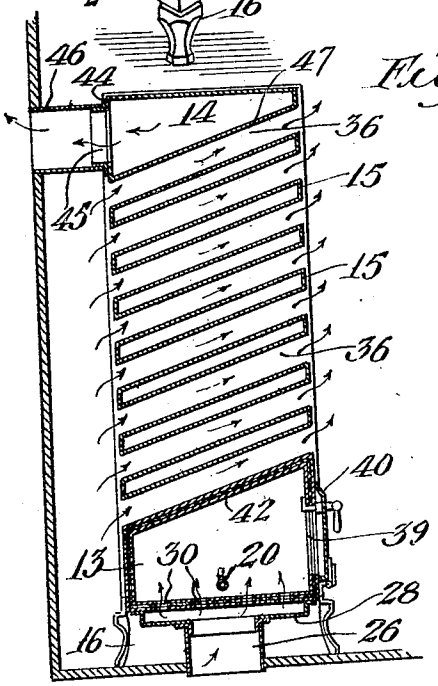


Fig. 3.



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UNITED STATES PATENT OFFICE.

DAVID M. BOWEN, OF LOS ANGELES, CALIFORNIA.

GAS RADIATOR.

1,413,826. Specification of Letters Patent. Patented Apr. 25, 1922.

Application filed August 11, 1921. Serial No. 491,377.

To all whom it may concern:

Be it known that I, DAVID M. BOWEN, a citizen of the United States, residing at Los Angeles, in the county of Los Angeles and State of California, have invented a new and useful Gas Radiator, of which the following is a specification.

My invention relates to the art of heating and more particularly to a gas radiator.

One of the objects of my invention is to produce a gas radiator that will give the maximum of efficiency at a very low cost.

Another object of my invention is to produce a radiator of simple form and construction which will heat and circulate the surrounding air without discharging any of the products of combustion into the room.

Another object of my invention is to produce a radiator of the class described which draws its supply of combustible air from the outside atmosphere.

Referring to the drawing which is for illustrative purposes only,

Figure 1 is a perspective view of my improved gas radiator.

Fig. 2 is a vertical sectional view on line 2—2, Fig. 1, and

Fig. 3 is a cross section on line 3—3, Fig. 2.

Like reference numerals correspond to like parts throughout the several views.

The radiator consists generally of side members or columns 11 and 12, a combustion chamber 13, a top 14, heat transfer flues 15 and legs 16.

The combustion chamber 13 forms the bottom of the radiator and is provided with a burner 20 having gas tips 21. Gas is supplied to the burner 20 from any convenient source by a pipe 23, the amount required being regulated by a valve 24. Air is supplied to the burner by a pipe 26 which passes through the floor of the room in which the radiator is placed. One end of the pipe 26 is open to the outside air, the other being connected to an air manifold 28 secured to the bottom 29 of the combustion chamber. 30 designates openings in the bottom 29 of the combustion chamber through which the air from the manifold 28 passes to the combustion chamber 13.

The sides or columns 11 and 12 of the radiator are composed of hollow rectangular sheet metal members. The inner face 35 of each member is punched to receive the ends of hollow rectangular flues 15. These flues are spaced apart from one another by spaces 36 and are angularly disposed for reasons hereinafter set forth.

Baffles 38 are provided on the inside of the columns 11 and 12 between alternate flue openings to course the products of combustion and hot gases in their passage through the radiator.

The inside of the combustion chamber 13 and the burner are accessible through an opening 39 in the front of the radiator. This opening is provided with a door 40. An opening 41 in the top 42 of the combustion chamber 13 allows the products of combustion and hot gases to enter the column 12 of the radiator. The top 42 is angularly disposed to conform to the angularity of the flues 15.

The top 14 of the radiator is a hollow rectangular member provided on the rear wall 44 with an outlet 45 which connects with a pipe 46 for carrying the products of combustion to the outside air. The bottom 47 is angularly disposed to conform to the angularity of the flues 15.

The operation of my improved radiator is as follows:

The products of combustion and heated air from the combustion chamber pass through the opening 41 into the column 12 of the radiator where they strike the first baffle 38 which deflects the course of the gases into and through the lowest flue 15 thence into the other column 11 of the radiator where they are again deflected by a baffle 38 into and through the next flue 15 back to the column 12 above the first baffle, where they strike another baffle 38 and are deflected through the next flue, passing back and forth from side to side of the radiator until they reach the top 14 from which they pass into the pipe 46 to the outer air.

During the time the products of combustion and hot gases are passing from the combustion chamber back and forth through the flues 15 to the top 14, air in the room is being heated by circulating through the radiator between the flues in the direction of the arrows, Fig. 3. This circulation is caused by the angular disposition of the flues 15. The heated air between the flues 15 in trying to escape pass upwardly against the lower side of the flues 15, the upward tipping of each flue causing a forward movement of the air.

It will be noted that by the time the products of combustion and hot gases pass from the combustion chamber back and forth in their zig-zag course through the flues 15 to the top 14, most of the heat has been transferred to the air surrounding the radiator and practically all stack losses of heat are eliminated, thus producing a very high efficiency heating unit.

What I claim and desire to secure by Letters Patent is:

1. A radiator comprising walls forming a combustion chamber; legs supporting said combustion chamber on but slightly above a floor; walls forming an air manifold below said combustion chamber, the wall between said air manifold and said combustion chamber being perforated to allow air to pass therethrough; a pipe connected into said air manifold and extending downwardly through said floor; a gas burner in said combustion chamber; two hollow rectangular sheet metal columns, one situated above each end of said combustion chamber, one of said columns being in open communication with said chamber; a series of sheet metal flues each extending between said columns and communicating at either end with the interior of said columns; baffles in said columns so disposed that the gases rising from said combustion chamber pass successively through said flues; a hollow top for said radiator so formed that the hot gases from one of said columns is discharged thereinto; and an outlet flue connecting the interior of said top with a chimney.

2. A radiator comprising walls forming a combustion chamber; legs supporting said combustion chamber on but slightly above a floor; walls forming an air manifold below said combustion chamber, the wall between said air manifold and said combustion chamber being perforated to allow air to pass therethrough; a pipe connected into said air manifold and extending downwardly through said floor; a gas burner in said combustion chamber; two hollow rectangular sheet metal columns, one situated above each end of said combustion chamber, one of said columns being in open communication with said chamber; a series of sheet metal flues each extending between said columns and communicating at either end with the interior of said columns, each of said flues having flat sides extending substantially across the whole width of said columns and inclined to the horizontal; baffles in said columns so disposed that the gases rising from said combustion chamber pass successively through said flues; a hollow top for said radiator so formed that the hot gases from one of said columns is discharged thereinto; and an outlet flue connecting the interior of said top with a chimney.

3. A radiator comprising walls forming a combustion chamber; legs supporting said combustion chamber on but slightly above a floor; walls forming an air manifold below said combustion chamber, the wall between said air manifold and said combustion chamber being perforated to allow air to pass therethrough; a pipe connected into said air manifold and extending downwardly through said floor; a gas burner in said combustion chamber; two hollow rectangular sheet metal columns, one situated above each end of said combustion chamber, one of said columns being in open communication with said chamber; a series of sheet metal flues, each extending between said columns and communicating at either end with the interior of said columns, each of said flues having flat sides extending substantially across the whole width of said columns and inclined to the horizontal; baffles in said columns so disposed that the gases rising from said combustion chamber pass successively through said flues; a hollow top for said radiator so formed that the hot gases from one of said columns is discharged thereinto; and an outlet flue connected to that side of said top which is above the lower end of said inclined flues.

In testimony whereof, I have hereunto set my hand at Los Angeles, California, this 5th day of August, 1921.

DAVID M. BOWEN.