

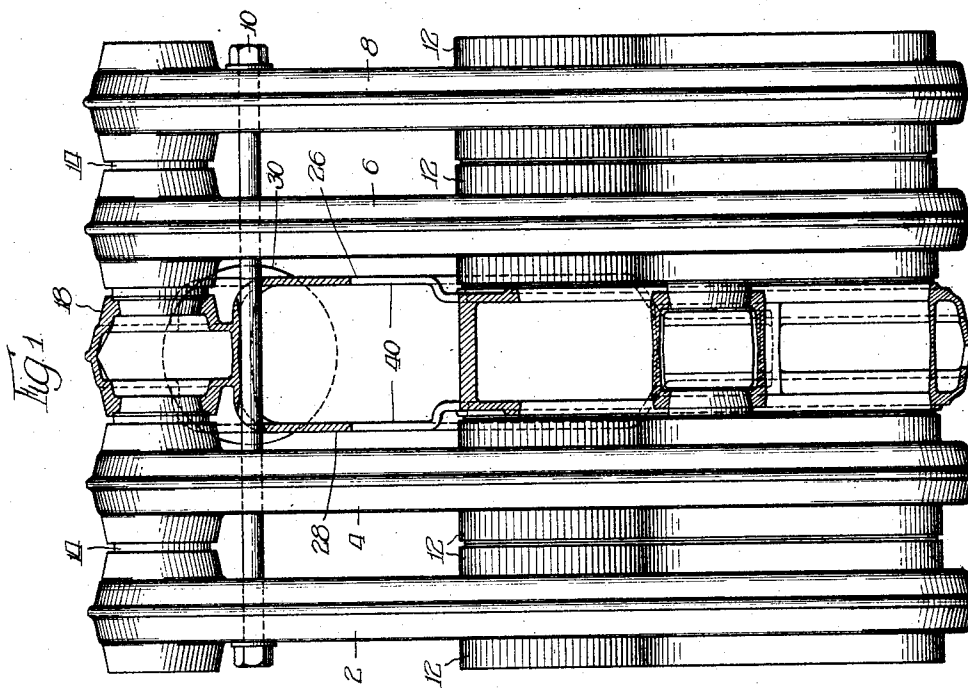
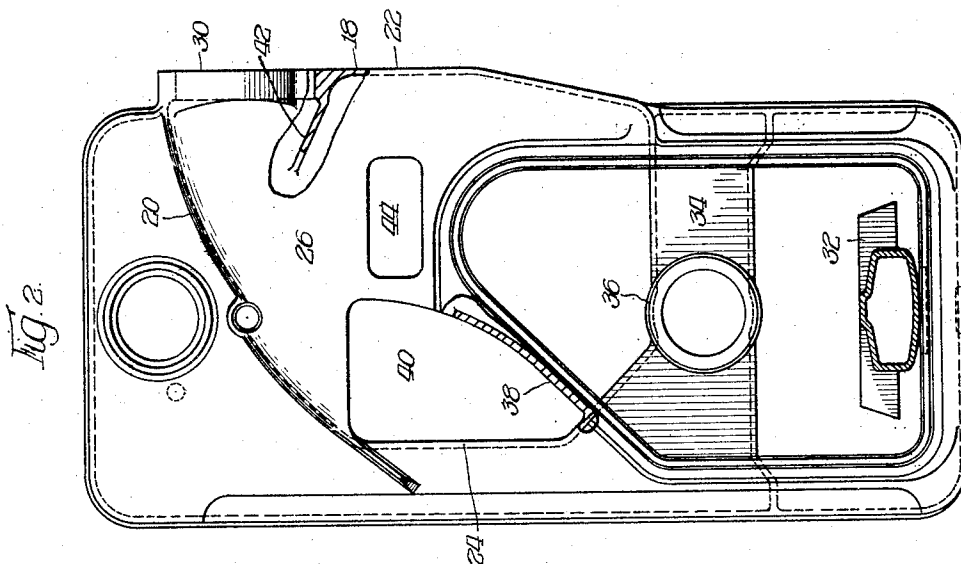
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G. C. CARNAHAN

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RADIATOR

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Inventor:
Glen C. Carnahan,
By *Williamson Hubley Byron Knight*
attys.

UNITED STATES PATENT OFFICE

GLEN C. CARNAHAN, OF CHICAGO, ILLINOIS, ASSIGNOR TO JAMES B. CLOW & SONS, OF CHICAGO, ILLINOIS, A CORPORATION OF ILLINOIS

RADIATOR

Application filed January 2, 1931. Serial No. 506,127.

This invention relates to gas fired heating devices and as illustrated herein is embodied in a gas fired steam radiator of the same general type as that disclosed in United States Letters Patent No. 1,580,651, granted April 13, 1926, to Eugene V. Daily and assigned to the assignee of the instant application.

Radiators of this class comprise, generally speaking, a series of sections having a combustion chamber disposed within the lower part thereof and the customary water columns located above the combustion chamber. Within this latter chamber there is positioned a fuel burner and in order to carry off the products of combustion from the burner the radiator is provided with a specially constructed section that is in connection with a flue outlet. Products of combustion generated throughout the length of the lower part of the radiator flow into the specially constructed section and from thence flow to the flue outlet.

In the operation of such radiators, it is not uncommon for a back draft of air to rush down the flue with the result that unless some provision to the contrary is made the danger arises of the burner being extinguished and the gaseous fuel escaping directly into the room. Again if there is a strong out-draft rushing through the flue, and unless some provision is made to compensate such draft, there is a tendency for the flame to be lifted off of the burner, with the result that unburned gas escapes into the room.

In the patent referred to there is disclosed a unique, specially constructed section which, for the sake of convenience is termed a vent section, and as disclosed in said patent, the vent section is located approximately centrally of the length of the radiator and comprises a walled chamber having a flue connection in the rear wall, an atmospheric or relief opening adjacent to the front wall and means for directing the products of combustion from the burner toward the flue connection.

In operation, the products of combustion in the radiator flow lengthwise into the spe-

cially constructed vent section and thence move in a rising direction toward the flue connection, the course of the rising movement being directed by a baffle which extends in the direction of the flue opening. It is only in the event of strong up-drafts or down-drafts that the atmospheric or relief opening comes into play, but under those extraordinary conditions it takes an important part in the operation of the radiator. In the event a strong back draft rushes down the flue it enters the radiator through the flue connection and instead of flowing downwardly onto the burner extinguishing the flame it is directed through the atmospheric relief opening by means of the same baffle that guides the upwardly rising products of combustion.

On the other hand, when a strong out-draft occurs there is a suction created through the flue connection which ordinarily would tend to lift the flame off the burner, but, by virtue of the atmospheric relief opening, the suction is relieved by air from the room rushing through the opening, and therefore the burner flame is not disturbed.

All that has been said of the radiator is disclosed in the Daily patent referred to, and the present invention is predicated upon an improvement of the patented structure. In accordance with the improvement the applicant herein has provided a second or supplementary baffle which aids in directing the various drafts flowing through the radiator. The additional baffle is particularly advantageous in controlling the direction of back draft flowing down the flue since such baffle is located directly beneath the flue connection and serves to catch the down-coming back draft and send it immediately in the direction of the atmospheric relief opening.

Another improvement feature of the invention consists in the provision of supplementary or auxiliary atmospheric relief openings which co-operate with the adjacent larger atmospheric relief opening in compensating back draft and strong up draft conditions.

As illustrated herein, the supplemental openings are smaller than the openings al-

ready discussed and serve the dual function of admitting an additional amount of air in the case of strong up draft and permitting the escape from the radiator of a particularly strong back draft.

It has been found that both of the improved features contribute to the successful operation of the radiator and are therefore deserving of protection.

Additional objects and features of the invention will become apparent from a reading of the following specification in the light of the accompanying drawing, in which

Figure 1 shows generally a series of radiator sections having a specially constructed vent section mounted centrally thereof, and

Fig. 2 is a view in side elevation of one of the specially constructed vent sections.

As shown in the drawing, the reference numerals 2, 4, 6 and 8 indicate sections of the radiator that are joined together by means of tie rods 10. The lower portion of each of these sections is formed with a combustion chamber 12 and the combustion chambers of all of the sections are in alignment and communication with one another. Water columns extend upwardly from the combustion chambers and are in communication with one another at the top of the radiator by means of nipples 14. Since all of this is fully disclosed and explained in the prior Daily patent no further reference to the exact construction of the sections will be given herein.

Products of combustion forming in the radiator sections flow, as illustrated in the drawing, lengthwise of the combustion chamber into a central vent section 18 which is specially constructed as shown in Figure 2. As shown in Figure 2, the vent section is of the same approximate configuration as the adjacent unvented sections and comprises a chamber having a top wall 20, a rear wall 22, a front wall 24, and side walls 26 and 28. In the top portion of the rear wall 22 there is formed a flue connection 30 which permits products of combustion rising in the vent section to escape through a chimney or other suitable flue.

In Figure 2 there is shown in section a burner 32 which is employed to heat the water boxes 34 and it is to be understood that in the construction of the complete boiler the water boxes 34 in the plurality of aligned sections are joined with one another by means of the nipples 36 in a manner similar to the joining of the tops of the sections by the nipples 14 and products of combustion formed by the burner 32 rise and flow upwardly between the adjacent water boxes 34 and thence lengthwise of the radiator into the central vent section 18. Within this section they rise and are guided in their movements by means of the various walls referred

to until they finally exit through the flue connection 30. To direct the rising products of combustion toward the flue connection there is provided a baffle 38 which extends upwardly in the direction of the flue connection 30. Thus rising products of combustion strike the baffle 38 and are deflected toward the flue connection. Located immediately above the baffle and in the opposite side walls of the vent section (Figure 1) there is a plurality of atmospheric or relief openings 40, the purpose of which has already been pointed out and will be explained further at this time.

It occasionally happens that a back draft flows down the flue and into the vent section and unless provision is made to accommodate such drafts they tend to impinge upon the burner and extinguish the flame. However, by means of the atmospheric or relief openings 40 that are provided in the illustrated section, the back draft flows through the flue connection 30 and out of the atmospheric connections 40, being assisted in its course by means of the baffle 38. On the other hand, it sometimes happens that there is a strong draft going up the flue which exerts a tendency to lift the flame off of the burner with the result that the flame is extinguished or that unburned gas escapes into the room. Here again the atmospheric openings 40 permit the entrance to the vent section of air from the room to equalize the suction caused by the strong up draft.

In order still better to direct a down-coming draft to the atmospheric relief openings 40 and the better to protect the burner from the actions of such drafts, there is provided a second or supplemental baffle 42 which acts upon the air immediately upon its entering the vent sections and crowds it close to the top wall 20 of the chamber and sends it straight to the atmospheric openings 40. The provision of the secondary baffle is beneficial and increases the efficiency of the radiator during a down draft.

In order to permit the escape of the products of combustion during a strong down draft and to afford a supplemental or auxiliary supply of air from the room during a strong up draft the side walls 26—28 of the vent section are provided with supplemental atmospheric openings 44 that are smaller than the atmospheric relief openings 40 and are located between the flue outlet and the burner.

During a back draft within the radiator there is a tendency for the products of combustion to be siphoned out through the atmospheric relief openings 40 and the provision of the supplementary openings 44 permits an additional means of escape for the products of combustion. Similarly, as already pointed out, it affords a secondary sup-

ply of air to relieve a strong out draft condition.

It is to be understood, of course, that various modifications and simplifications and rearrangement of parts may be made in the illustrative embodiment of the invention without departing from the true scope of the invention as outlined herein and set forth in the appended claims.

10 Having thus described the invention, what I claim as new and desire to cover by Letters Patent is:

1. A radiator of the class described having, in combination, a vent section and a plurality
15 of adjacent communicating sections, said vent section comprising a chamber, a flue connection extending from the chamber, a side wall of the chamber having a large atmospheric opening at a point remote from the flue connection, and said wall having a smaller supplemental opening disposed between the
20 larger opening and the flue connection.

2. A radiator of the class described having, in combination, a vent section and a plurality
25 of adjacent communicating sections, said vent section comprising a chamber, a flue connection leading from the chamber, the said walls thereof having a plurality of large atmospheric openings, means for directing out-going products of combustion toward the flue
30 connection, additional means for directing down-coming products of combustion toward the large atmospheric openings, and said side walls also having a plurality of smaller supplemental openings adapted to co-operate
35 with the large openings.

3. A vent section of the character described comprising, in combination, a walled chamber, a flue connection leading from the rear
40 wall of the chamber, the side walls of the chamber each having a large atmospheric opening disposed at a point opposite to and below the flue connection, a baffle below the atmospheric openings extending in the direction
45 of the flue connection, a baffle below the flue connection extending in the direction of the atmospheric openings, and each side wall also having a smaller supplemental atmospheric opening adapted to cooperate with the
50 larger openings.

Signed at Chicago, Illinois, this 19th day of December, 1930.

G. C. CARNAHAN.