G. GABET.

FIREPLACE WATER BACK.

APPLICATION FILED MAY 13, 1921.

1,426,976. Patented Aug. 22, 1922.

Fig. 1.

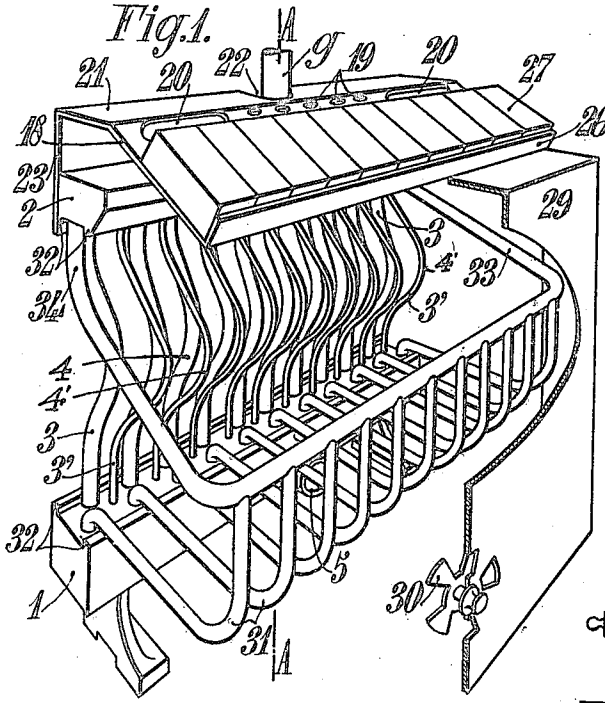


Fig. 2.

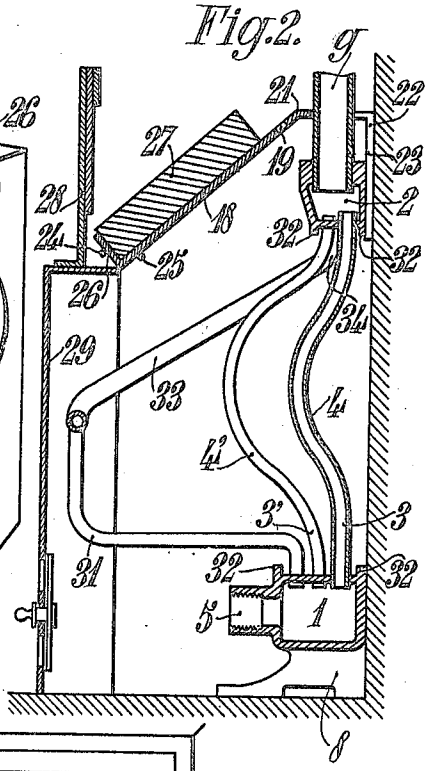
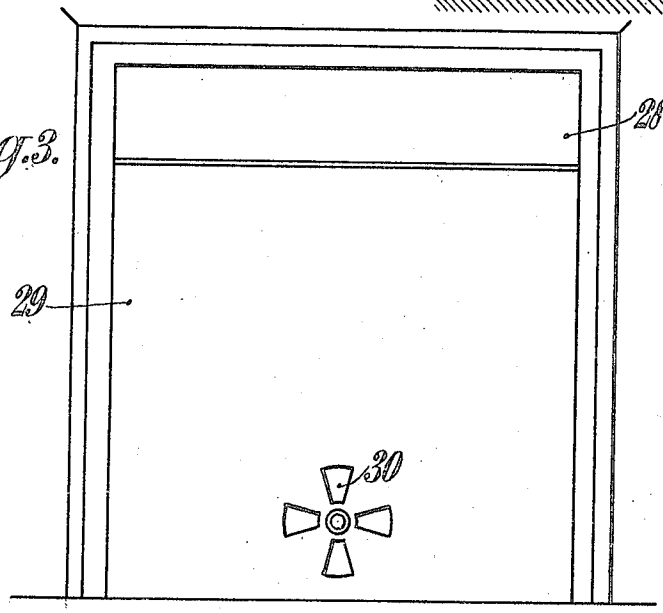


Fig. 3.



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UNITED STATES PATENT OFFICE.

GUSTAVE GABET, OF PARIS, FRANCE.

FIREPLACE WATER BACK.

1,426,976. Specification of Letters Patent. Patented Aug. 22, 1922.

Application filed May 13, 1921. Serial No. 469,269.

To all whom it may concern:

Be it known that I, GUSTAVE GABET, citizen of the French Republic, residing at Paris, France, have invented certain new and useful Improvements in or Relating to Fireplace Water Backs, of which the following is a specification.

This invention relates to an improvement in the type of water back disclosed in the United States patent application Serial No. 343700 filed 19th December, 1919, and has for its object to increase the heating surface of the water tubes for the purpose of increasing the efficiency of the water back.

In the accompanying drawing, given by way of example only,

Fig. 1 is a perspective view partially broken away and in section of the improved fire-place water back.

Fig. 2 is a vertical sectional view on the line A—A of Fig. 1.

Fig. 3 is a front elevation of the fire-place, showing the front casing or cover in position.

According to the present improvements, a baffle 18 is arranged above the water tubes and is adapted, in order to obtain a better utilization of the calories to cause the combustion gases to pass through the bulged portions 4 and 4^1 of the tubes 3 and 3^1, respectively.

To effect that, this baffle 18, which may be made of sheet iron or cast-iron, is provided at its upper part with openings 19, 20. The openings 20 have a greater total area than that of the group of smaller openings 19 and are arranged on opposite sides of the latter, so as to divide the combustion gases into two upward currents on the sides of the group of tubes 3.

The horizontal portion 21 of the baffle may also be provided with draught holes, but these latter will preferably be made after erection of the structure, after trial and according to the working of the fire-place in which the hood is arranged. The horizontal portion 21 has a cut-away part 22 giving passage to the outlet pipe *g*. This cut away part 22 may be extended or not on the vertical rear portion 23 of the baffle, which wedges, when fitting up the structure, between the header 2 and the back of the fire place, so as to ensure the fixation. It suffices, moreover, for obtaining a sufficient immovableness of the baffle, to complete the fitting up by means of nails 24, 25, driven on each side of the fire-place. The latter thus remains removable and can be readily taken off at the time of sweeping the chimney.

The front portion of the baffle is provided with a ledge 26 allowing, if necessary, to arrange on the latter a lining 27 made of refractory material preventing the radiation of the heat inside the fire-place. This lining 27 may be composed of bricks resting on the baffle 18 and held in position by the ledge 26.

This baffle, moreover, might itself be made of refractory material, but in any case, its dimensions will be such that it will leave, between its outer edge and the shutter 28 of the fire-place, a sufficient space so that the sum of the surfaces offered to the passage of the gases will conform to existing requirements.

This arrangement for the concentration of the calories lost by the hearth allows of increasing the heating surface of the water pipes and, for instance, for utilizing two rows of tubes forming also bulged portions such as 3^1.

For that purpose, the two rows of vertical tubes 3 and 3^1 are arranged in staggered relation on each of the headers 1 and 2 and the bulged portion 4 formed on the tubes 3 of the rear row is smaller than that of the tubes 3^1 of the front row. The distances between the axes of the tubes 3 and 3^1 are identical, but the tubes 3 have a larger diameter than that of the tubes 3^1 so that they constitute behind the latter a kind of screen which directs the combustion products towards the rear part of the tubes 3^1 with which the flames come in contact exteriorly and laterally. The speed of flow of the gases is then subjected to a slowing down which is prolongated by their contact with the tubes before the said gases escape, between the tubes 3^1, towards the chimney.

The heating surface may be further increased by the arrangement of a third row of tubes 31 bent and curved forward so as to constitute a tubular grate adapted to receive the fuel and in which circulates the water. The tubes of this grate are characterized, as the other tubes of this system, by the absence of joints. The expansion of the tubes adopted in industrial boiler is replaced, in the present device by brazings and in order to effect these brazings more easily, the two or three rows of tubes are

branched on one and the same face of the headers which, for that purpose, may be provided, at the time of machining the same, with small heads 32.

The tubes 31 constituting the tubular grate open in a header constituted by a tube 33 of larger diameter, which terminates at each of its ends 34 in the upper header 2. The water back is supported on feet 8 and is supplied with water through the connection 5.

It is to be understood that this header tube 33 might be constituted by a header made in one piece and secured in position or by a header made in three parts connected by couplings.

On the other hand, it is obvious that the water back may comprise only one row of vertical tubes and that the single tube or groups of transverse tubes acting as a boiler-tube mentioned in the patent application Serial No. 343700 and occupying the empty space of the bulged portion 4 of the tubes 3 may subsist or not, without departing thereby from the principle of the invention.

The addition of these various reinforcements thus permits of establishing a series of generators constituted by uniform and interchangeable elements.

These arrangements may be combined with a front casing 29 (Figs. 2 and 3) fitting in the frame of the fire-place for the purpose of obtaining, particularly during the night, a slower combustion. This casing has the shape of a rectangle parallelepipedon covering the front of the grate down to about one half the height of the frame. It carries, at its lower part, a damper 30 allowing to adjust the draught by the admission of air, so as to slow down the combustion, preferably during the night, as in the day time, the visible fire is both agreeable and hygienic, owing to the ventilation it creates in the room.

In this case, the damper 28 must be pulled down until it comes in contact with the upper part of the casing 29.

Moreover, by combining the water back herein described with the check valve mentioned in the United States patent application Serial No. 343700, a distribution of hot water may be obtained. In fact, if an overflow is open on the heating conduit, the difference of the pressures between the feeding pressure (town pressure) and that existing in the said conduit, determines the automatic closing of the valve and the throwing out of circuits of the radiators. The closing of the over-flow cock, feeding hot water to a bath room for instance, brings back everything in the initial condition and gives back to the plant its central heating function.

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

1. In a fire-place water back, upper and lower headers, a double row of curved water tubes connected with the headers, the concave curvatures of the tubes being disposed towards the back of the fire-place, the curvature of the tubes forming the outer row being of greater diameter and more accentuated than the curvature of the inner row, a row of water tubes constituting a fire grate connected with the lower header, a front header connected with the last mentioned row of water tubes and arranged at a higher level than the lower header, and means connecting the extremities of the front header with the upper header.

2. In a fire-place water back, headers, curved water tubes connected with the headers having the concave curvatures thereof disposed toward the back of the fire-place, and a baffle arranged in the fire-place having elongated lateral openings and central circular openings of relatively small diameter, the total area of the lateral openings being greater than that of the central openings.

3. In a fire-place water back, upper and lower headers, a double row of curved water tubes connected with the headers, the concave curvatures of the tubes being disposed towards the back of the fire-place, the curvature of the tubes forming the outer row being of greater diameter and more accentuated than the curvature of the inner row, a row of water tubes constituting a fire-grate connected with the lower header, a front header connected with the last mentioned row of water tubes and arranged at a higher level than the lower header, a baffle arranged in the fire-place having elongated lateral openings and central circular openings relatively of small diameter, the total area of the lateral openings being greater than that of the central openings, a movable front casing for the fire-place having an opening in the lower portion thereof, and a damper for controlling said opening.

In testimony whereof I affix my signature.

GUSTAVE GABET.