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F. J. LOCHEN

BAFFLE PLATE FOR BOILER FLUES

Filed Sept. 11, 1925

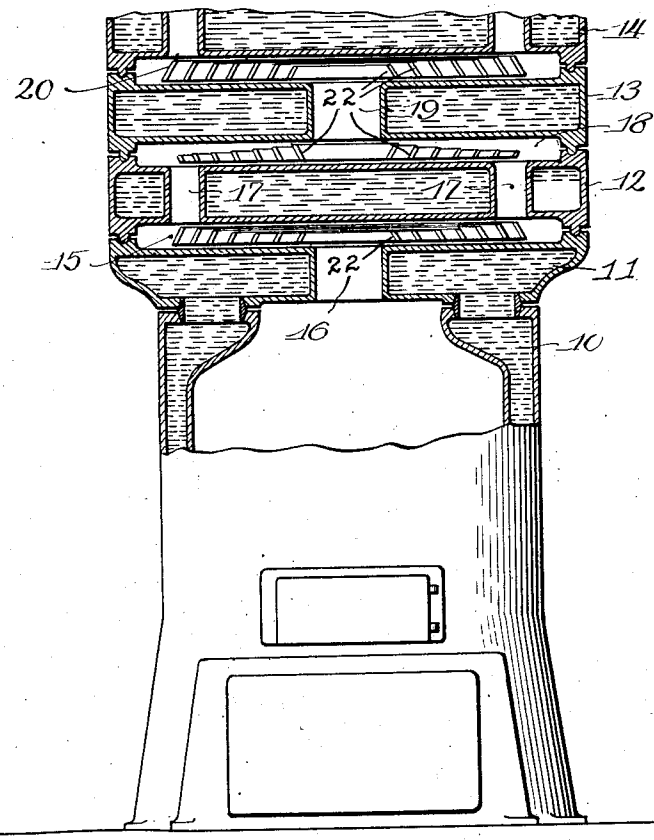


Fig. 1

Fig. 2

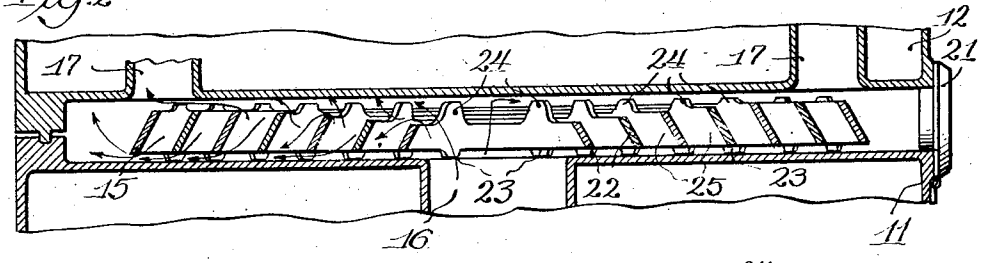


Fig. 3

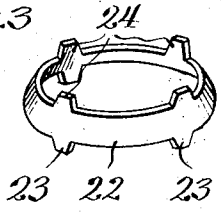
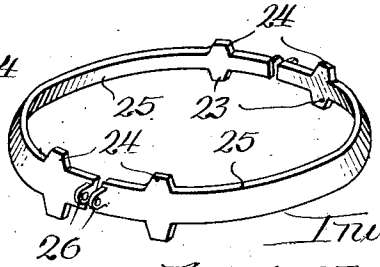


Fig. 4



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UNITED STATES PATENT OFFICE.

FRANK J. LOCHEN, OF CHICAGO, ILLINOIS.

BAFFLE PLATE FOR BOILER FLUES.

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This invention relates to improvements in baffle plates adapted to be removably inserted in the flues of boilers for interrupting the flow of hot gases therethrough and for distributing the gases in the flue so that all of the available heat units will be distributed throughout the heating surfaces of the flues thereby increasing the heating efficiency of the boiler with a material reduction in fuel consumption.

It has been found that as the heated gases pass through the flue, and especially in oil burning furnaces and coal burning boilers that have been converted into oil burning boilers, the heating units in their passage through the flue do not all contact with the heating surfaces with the result that a great amount of heat is lost and passes out of the stack.

The heated gases have a free passage through the flue and only some of them hug some of the surfaces of the flues while other portions of the flue surfaces are not contacted by the heated gases.

It is one of the objects of the present invention to provide improved baffles which are separate from and independent of the flues and are adapted to be inserted into the flues to interrupt the flow of the heated gases therein and to cause the gases to flow in a tortuous passage so that all of the surfaces of the flues will be contacted by the hot gases and thereby utilize all of the heat units in the gases and prevent them from escaping from the flue.

A further object is to provide improved baffles of this character which may be readily inserted into the flues of boilers now on the market without in any manner altering the construction of such boilers and which will effectively break up the gases and distribute them throughout the entire area of the flue and at the same time the baffles may be readily removed from the flue.

A further object is to provide improved baffles of this character which will provide a minimum amount of contacting surface with the wall of the flue into which they are inserted.

To the attainment of these ends and the accomplishment of other new and useful objects as will appear the invention consists in the features of novelty in substantially the construction, combination and arrangement of the several parts as hereinafter more fully described and claimed and as shown in the accompanying drawings illustrating the invention and in which,

Figure 1, is a diagrammatic view partly in elevation, partly in section, and partly broken away, of a round form of boiler having baffles constructed in accordance with the principles of this invention arranged in the flues.

Figure 2, is an enlarged sectional view of a portion of the boiler illustrated in Figure 1 and one of the flues, with these improved baffles in position therein.

Figure 3, is a detail perspective view of one of the baffles.

Figure 4, is a detail perspective view of another of the baffles.

Referring more particularly to the drawings, the numeral 10 designates generally a boiler having sections 11, 12, 13, and 14, superposed and secured together in any suitable manner.

Between the sections 11 and 12 is a flue 15 with which a flue 16 passing through the section 11 connects and the section 12 is also provided with flues 17 communicating with the flue 15.

A similar flue 18 is arranged between the sections 12 and 13 and a flue 19 passes through the section 13 and communicates with the flue 18 and also with a similar flue 20 between the sections 13 and 14, and the flues 16, 17 and 19 are so arranged that they will be out of registering alinement so that the heated gases will be caused to flow in directions across the faces of the flues. Each of the flues 15, 18, and 20 being provided with the usual clean out openings closed by the usual doors or closures 21, it being understood that the said entrance openings are of a sufficient size to permit the baffles to be freely inserted into the flue and as freely removed therefrom.

All of the above referred to parts are of the ordinary and well known construction and constitute no part of the present invention.

The numeral 22 designates an annular baffle member constructed of any suitable material and of such a weight that it will be maintained in place when inserted into the flue.

The member or element 22 is preferably of a frustro-conical shape and is provided with spaced lugs 23 projecting beyond one edge thereof and spaced lugs 24 projecting beyond the opposite edge.

This member is adapted to be inverted and will be supported by means of the lugs 23 or 24 according to the position of the element and which lugs constitute supports or feet for holding the edge of the member or element above the bottom of the flue and the lugs being spaced they will not interrupt the flow of heated gases beneath or above the member or element in the event that the respective lugs should engage the top of the flue.

Any number of these baffle members or elements 22 may be provided according to the diameter of the flue or passage into which they are inserted and the elements are of varying diameters so that they will be concentrically arranged within the flue and at the same time provide flue spaces between adjacent elements.

The elements are of varying height and are so arranged with respect to each other that the element which is lowest in height will be in position to be first contacted by the heated gases as they enter the flue, the gases engaging the tallest element just before leaving the flue.

The gases will be directed by the baffles against the walls of the flue and they will also flow through the spaces between the baffles and in a tortuous path before passing out of the flue.

If desired some of the baffle elements may be formed of sections 25 secured together in any suitable manner such as by means of bolts or screws passing through apertured ears or lugs 26 on the sections thereby facilitating the insertion of the baffle elements.

In placing the baffles in position the innermost baffle elements may be nested and inserted together after which the sectional members may be put in position about the other members and the sections secured together.

By reason of the frustro-conical shape of the baffle members they may be arranged in the position shown in Figure 2 so that the angle of inclination of the members will be opposed to the entrance of the gases, the gases in this instance entering through a centrally arranged flue 16.

When the entrance flues 17 (see Figure 1) are arranged adjacent the periphery of the boiler section the baffle members are inverted to the position shown in Figure 1 in the flue 18 and the height of the respective baffle members is such that the lowermost baffle will be first contacted by the heated gases.

The lugs 23—24 forming feet will contact with a minimum area of the flue walls and so as not to cover any great surface of the flue walls. Furthermore the baffle members will direct the heated gases to all parts of the flue.

This form of the invention is particularly adapted for use in round boilers and any number of baffles may be employed, their weight being such that they will be maintained in position after being placed in the flue.

With this invention it will be manifest that the hot gases will be interrupted in their passage through the flues and will be directed against the walls of the flue and at the same time they will flow in a tortuous passage through the flues with the result that all the heating units will be utilized and the "stack heat" will be reduced to a minimum with the further result that the efficiency of the boiler will be increased and the fuel consumption materially reduced, at the same time the baffles may be readily inserted into a flue and as readily removed therefrom.

Obviously these baffle elements may be employed in the flues in any form or type of boilers or boiler construction.

While the preferred form of the invention has been herein described and shown it is to be understood that various changes may be made in the details of construction and in the combination and arrangement of the several parts within the scope of the claims without departing from the spirit of this invention.

What is claimed as new is:

1. In combination, a flue, a plurality of concentrically arranged baffles for the heated gases, said baffles being disposed transverse to the direction of flow of the gases and being independent of each other and of the flue and adapted to be freely inserted into and removed from the flue.

2. In combination, a flue, a series of baffles for the heated gases, said baffles being independent of each other and of the flue and adapted to be freely inserted into and removed from the flue, the said baffles extending in directions transverse to the direction of flow of the gases through the flue, and means spacing the baffles from the top and bottom of the flue.

3. In combination, a flue, and a series of baffles for the heated gases, independent of each other and of the flue and adapted to be freely inserted into and removed from the flue, the said baffles extending transversely of the flue and increasing in height from one end to the other end of the series.

4. In combination, a flue, and a series of baffles for the heated gases, independent of and adapted to be freely inserted into and removed from the flue, the said baffles being independent of each other and spaced from the top and bottom of the flue and from each other and increasing in height from one end to the other end of the series.

5. In combination, a flue, and a series of concentrically arranged baffles independent of each other and of the flue and adapted to be freely inserted into and removed from

the flue, the said baffles being spaced from each other and from the top and bottom of the flue, the said baffles increasing in height from one end to the other end of the series and being inclined in a direction opposed to the direction of flow of the heated gases through the flue.

6. In combination, a flue, and a plurality of annular and independent baffles nested and spaced from each other within the flue, said baffles being independent of the flue, the longitudinal axis of the baffles being transverse to the direction of flow of gases through the flue.

7. In combination, a flue, a series of annular and independent baffles nested and spaced from each other within the flue, said baffles being independent of the flue, and increasing in height from one end to the other end of the series.

8. In combination, a flue, and a series of annular and independent baffles nested and spaced from each other within the flue, said baffles being independent of the flue and spaced from the top and bottom of the flue and increasing in height from one end to the other end of the series.

9. In combination, a flue, a series of annular and independent baffles nested and spaced from each other within the flue, said baffles being independent of the flue and spaced from the top and bottom of the flue and increasing in height from one end to the other end of the series, the said baffles being inclined in a direction opposed to the direction of flow of the heated gases in the flue.

10. In combination, a flue, and a plurality of nested baffles spaced from each other within the flue, said baffles being independent of the flue, certain of said baffles being of a sectional construction, the longitudinal axis of the baffles being transverse to the direction of flow of gases through the flue.

11. In combination, a flue, a plurality of nested baffles spaced from each other within the flue, certain of said baffles being of sectional construction, and means for detachably securing said sections together, the longitudinal axis of the baffles being transverse to the direction of flow of gases through the flue.

12. In combination, a flue, and a plurality of nested baffles independent of and arranged within the flue, said baffles being spaced from each other and from the top and bottom of the flue, the longitudinal axis of the baffles being transverse to the direction of flow of gases through the flue.

13. In combination, a flue, a series of nested baffles independent of and arranged within the flue, said baffles being spaced from each other and from the top and bottom of the flue, the said baffles increasing in height from one end to the other end of the series.

14. In combination, a flue, a series of nested baffles independent of and arranged within the flue, said baffles being spaced from each other and from the top and bottom of the flue, the said baffles increasing in height from one end to the other end of the series and inclined in a direction opposed to the direction of flow of the heated gases through the flue.

15. In combination, a flue, a plurality of nested and spaced baffles within the flue, said baffles being independent of each other and of the flue, and adapted to be individually inverted whereby they will be inclined in a direction opposed to the direction of flow of the heated gases through the flue, in either of their positions.

In testimony whereof I have signed my name to this specification, on this 8th day of September, A. D. 1925.

FRANK J. LOCHEN.