Feb. 21, 1933. H. I. PIATT 1,898,596

FLUE CLEANING DEVICE

Filed June 25, 1931

Fig. 1.

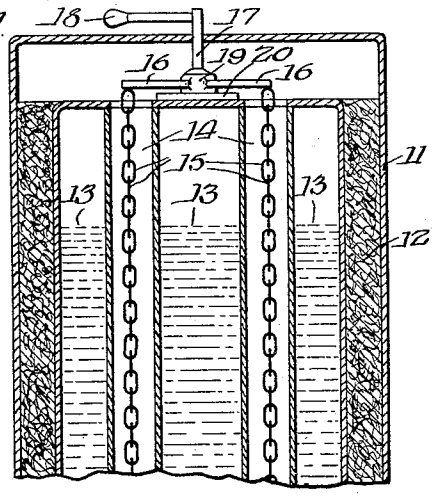


Fig. 3.

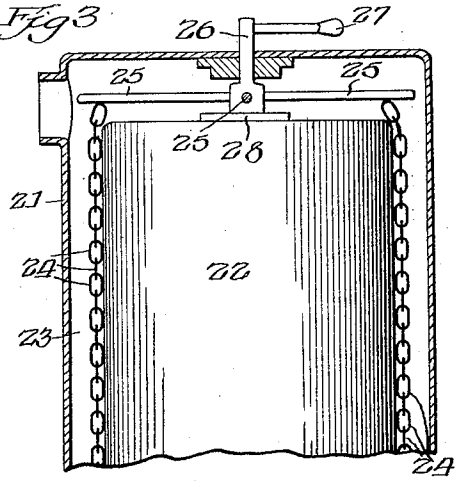


Fig. 2.

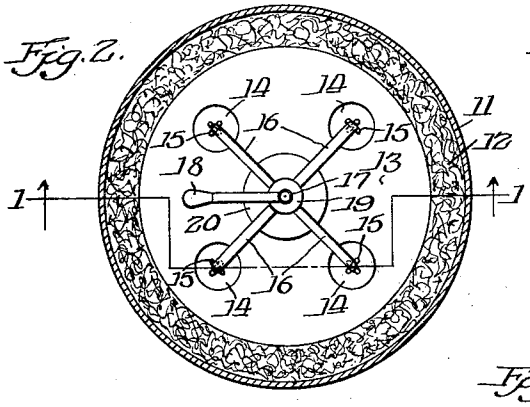


Fig. 4.

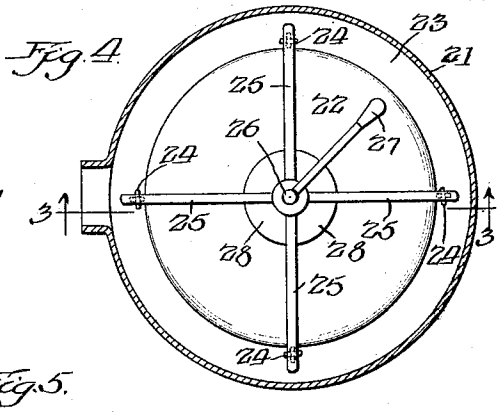
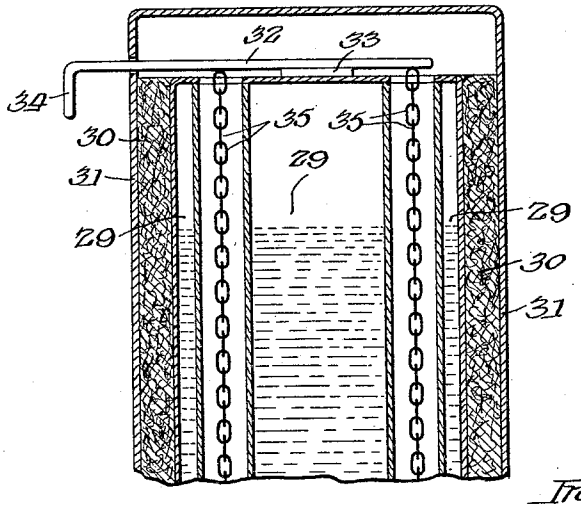


Fig. 5.



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UNITED STATES PATENT OFFICE

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FLUE CLEANING DEVICE

Application filed June 25, 1931. Serial No. 546,836.

My invention relates to the cleaning of flues of heating furnaces, and is herein set forth as applied to water heaters, although obviously applicable to other types.

Where the products of combustion pass through constricted passages, particularly where the walls of such passages are cooled by an adjacent body of water, there is a decided tendency to deposit soot on the walls, and this cooling acts as an insulating medium to retard the transfer of heat to the water in addition to interfering with the draft. The more restricted the size of the passage, the more tendency is there to deposit and the greater the difficulty of cleaning. By reason of the inaccessibility of such, cleaning is often neglected with decided loss in efficiency.

In order to clarify a description of the invention, embodiments of the same as adapted to varying flue arrangements are set forth in a schematic manner by way of illustration in the accompanying drawing wherein

Fig. 1 is a vertical section on the line 1—1 of Fig. 2 through an arrangement adapted to tubular flues;

Fig. 2 is a top plan of Fig. 1 below the cover shell;

Fig. 3 is a view partly in elevation and partly in vertical section through an adaptation to an annular flue on the line 3—3 of Fig. 4;

Fig. 4 is a top plan of Fig. 3 with the top shell removed; and

Fig. 5 is a vertical section through a slightly modified form of the device adapted to tubular flues.

Referring by way of example to Figs. 1 and 2 of the drawing there is indicated a heater shell 11 insulated at 12 furnishing a water space 13 traversed by a plurality of tubular flues 14. It is to be understood that the particular heater arrangements shown form no part of the present invention and are merely diagrammatic illustrations showing the adaptability of the invention to some of many types of heaters, whether employing as a fuel solid, liquid or other fuel.

Loosely suspended within the flues 14 are chains 15, the lower ends hanging loose in or below the lower ends of the flues, while the upper ends are attached to the arms 16 comprising a spider continuation of a shaft 17 provided exteriorly of the heater with an operating handle 18. The head 19 of the shaft from which the arms 16 extend may be pivoted to or rest loosely upon a support 20 within the furnace.

The device is operated to clean the flues of accumulated soot by grasping the handle 18 and oscillating the same so as to agitate the chains both longitudinally and laterally within the flues thus causing the same to strike and rub against the walls and dislodge the soot.

Having reference to Figs. 3 and 4, a type of furnace is shown in which the shell 21 encloses a boiler 22 with an intervening annular flue space 23. Here a plurality of chains 24 are suspended from the arms 25 forming a spider as a continuation of the shaft 26 provided with a handle 27, the shaft 26 being advantageously journaled in a footstep bearing 28 to permit the same to be rotated through a complete circle or oscillated. Here the chains 24 rest against the inner wall of the flue separating it from the body of water in the boiler, where the soot is most likely to collect and is most disadvantageous as forming an insulating medium.

In Fig. 5 a further embodiment is shown as applied to tubular flues within a body of water 29 protected by the insulation 30 in the shell 31. Here a horizontally disposed shaft 32 is employed resting upon a block 33 and adapted to be reciprocated or rocked by means of the laterally projecting handle 34. The reciprocation of the shaft 32 causes the chains 35 to move to and fro in contact with opposite walls of the flue and the rocking of the shaft causes the chains to be raised and lowered while the combination of these movements causes a particularly efficient contact between the chain links and the flue walls whereby to discharge the soot throughout their extent.

It will be understood that the invention is susceptible of modification within a wide range without sacrificing the true spirit of the invention, such, for instance, as a different

design of shaft operation, change of location to adapt the device to the cleaning of different flue constructions, the employment of jointed rod links or flexible cables instead of the conventional link chains here illustrated; the gist of the invention residing in the free suspension of flexible members within the flues and means for agitating the same in such manner as to cause wiping contact with the flue surfaces. By the term "flue" is included any passageway for the gases of combustion.

I claim:

1. The combination with a heater including flues, of means for cleaning said flues comprising a flexible element suspended loosely in each of the flues to be cleaned, and means exteriorly operable to agitate the said cleaning elements both longitudinally and laterally whereby to cause the same to strike and rub against the flue walls.

2. The combination with a heater including vertical tubular flues, of means for cleaning said flues comprising a flexible element suspended loosely in each of the flues to be cleaned, and means exteriorly operable to agitate the said cleaning elements both longitudinally and laterally whereby to cause the same to strike and rub against the flue walls.

3. The combination with a heater including flues, of means for cleaning said flues comprising a flexible element suspended loosely in each of the flues to be cleaned, and means exteriorly operable to agitate the said cleaning elements both longitudinally and laterally whereby to cause the same to strike and rub against the flue walls, said operating means including a shaft connected to each of the flexible elements and a handle for actuating the shaft.

4. The combination with a heater including flues, of means for cleaning said flues comprising a flexible element suspended loosely in each of the flues to be cleaned, and means exteriorly operable to agitate the said cleaning elements both longitudinally and laterally whereby to cause the same to strike and rub against the flue walls, said operating means including a shaft carrying a spider connected to each of the chains and a handle disposed outside the heater shell for agitating the shaft.

5. The combination with a heater including vertical flues, of means for cleaning said flues comprising a chain loosely suspended in each of the flues to be cleaned and means exteriorly operable to agitate the chain both longitudinally and laterally whereby to cause the same to strike and rub against the flue walls.

6. The combination with a heater including vertical flues, of means for cleaning said flues comprising a chain loosely suspended in each of the flues to be cleaned and means exteriorly operable to agitate the chain both longitudinally and laterally whereby to cause the same to strike and rub against the flue walls, said operating means including a shaft connected to each of the chains and a handle disposed outside the heater shell for agitating the shaft.

In testimony whereof I have hereunto subscribed my name.

HOWARD I. PIATT.