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Nov. 2, 1926. 1,605,449

J. A. MASONICK

HEATING DEVICE

Filed March 15, 1926

Fig. 1

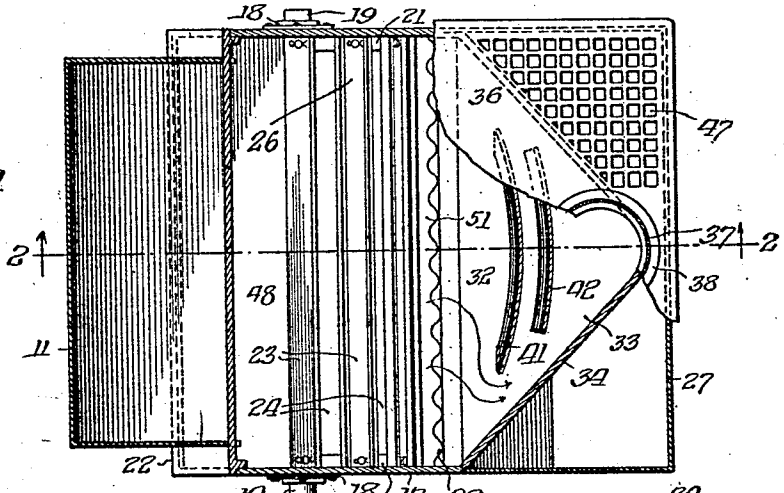


Fig. 2.

Witness:

Inventor

Joseph A. Masonick

By Ira J. Wilson Atty

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UNITED STATES PATENT OFFICE.

JOSEPH A. MASONICK, OF LAKE BLUFF, ILLINOIS.

HEATING DEVICE.

Application filed March 15, 1926. Serial No. 94,655.

My invention relates to heating devices, and particularly to a heating device for maintaining a uniform degree of temperature throughout a long period of time.

One of the objects of my invention is to provide a cheap, simple, and efficient heating device which will confine the combustion of the coal to a certain area in a furnace, so as to produce a vertical, rather than a flat, fire bed so that all the heat units may be utilized for heating the compartment in which the apparatus is located.

A unique feature and object of my invention is to provide an apparatus for the combustion of a solid fuel, wherein the burning fuel will be confined in area and to that area adjacent the conduction wall or plate or other portion of the furnace to which it is desired to transmit heat, so that an effective and efficient consumption of fuel will be had. In other words, the area of burning fuel is confined practically to that portion in contact with the conducting wall plate and to that portion of the fuel supplied immediately adjacent such wall or plate.

And I have not only devised novel apparatus, for it will be at once appreciated that a new method of consuming fuel for heating purposes is included. The fuel is fed continuously and automatically under its own weight and in accordance with the rate of combustion which may be controlled. This method I am aware may be utilized in many other and different structures other than that which is illustrated and described herein; for instance, steam boilers may be adapted to operate in accordance with my method.

Another object of my invention is to provide a heating apparatus which can be charged with fuel in such a manner that a supply will be available for a period of twenty-four hours or longer, and which supply of fuel will be automatically fed into the combustion area and the waste fuel in the form of ashes will be automatically deposited in a receptacle provided for the same.

Still another object of my invention is to provide a heating device wherein the combustion will take place in the central part of the same, and which combustion point will be almost entirely surrounded by air chambers, so that there cannot be any possibility of the device overheating to such a degree as to burn other articles in close proximity to the same, thus insuring a device which can be left untended after charging, without any fear of the fuel being burnt out or danger from overheating.

A still further object of my invention is to provide a heating device of the character described which will be automatically operated and which will be compact in form and through which the air in the room in which the same is located will be circulated and brought into contact with the heating portion of said device so that an even and constant degree of temperature may be maintained in the room throughout the entire time the charge of fuel in said heating device is being consumed.

A further object of my invention is to provide a heating device which will not choke and by reason of the perfect combustion obtained therein will produce absolutely no clinkers.

In this connection it will be noted that on account of the method of feeding the coal into the combustion area, there can be no waste coal, and no overheating of the furnace, all of which will produce perfect combustion and consequently no clinkers.

The objects and advantages hereinbefore briefly set forth will be apparent as will many others, when the device is considered in connection with the following specification, reference being had to the drawings submitted herewith, in which:

Fig. 1 is a transverse sectional view on the line A—A of Fig. 2 with a portion of the back of the heating device shown in plan, and

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

Like symbols of reference herein indicate like parts in both of the figures of the drawing.

The heating device is built of suitable castings and sheet metal and comprises a base 6 having legs 7 for supporting the same from the floor, and the flange member 8 at the upper part of said base is adapted to receive the front casting 9. This front casting is provided with a hopper or charging compartment 11 having a gate or door 12 at the upper end of the same which may be opened for charging the same with the fuel 13. The front wall 9 is also provided at its lower end with a door 14 which has the usual air admission ports (not shown), and this door permits access to the ash chamber 16 into which a pan or other receptacle (not shown) may be placed for catching the ashes as they

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drop from the combustion chamber. The heating device is provided with side walls 17 and each of these walls, at a position near the front of the same, is provided with bearing plates 18 for forming bearings for trunnions 19 on the revolving grate 21, while the front wall 9 is bellied as at 22 for providing space for the rotation of said grate.

The grate 21 is provided with a series of channel bars 23 throughout the circumference of the same and these channel bars are so mounted on the disc ends 24 of the grate 21 that their channels 26 are outwardly disposed, the purpose of which is hereinafter explained.

At a position substantially central between the front wall 9 and the rear wall 27 is a heating wall 28 and this heating wall is provided with corrugations 29 immediately at the back of the revolving grate 21, so that there will be less danger of the fuel clogging, and thus preventing the air from circulating upwardly from the ash chamber. The distance between the channel bars 23 on the revolving grate 21 and the nearest point of the corrugations on the heating wall 28 is, to give the best results, preferably about 1¼". At the upper end of the heating wall 28 there is a flange 31 to which is fastened by bolts or rivets 32 an inclined wall 33, and this wall 33 has its side flanges 34 extending up to the cover plate 36 and diverging inwardly as shown in Fig. 1 so as to form the circular portion 37 partially surrounding the opening 38 in said cover plate and to which is attached a flue pipe 39 for carrying off the waste products of combustion. Mounted on the inclined wall 33 are shown two baffle plates 41 and 42, and the arrows in Fig. 1 show the direction which the waste products of combustion must take in order to pass from the furnace into the flue 39. These baffles are for the purpose of confining the heat in the chamber 43 until all the units thereof have been consumed in heating the cool air passing upward through the chamber 44. This chamber 44 is open at the bottom as I have indicated by the numeral 46, and the top plate is provided with gratings or radiator members 47 which extend at each side of the upwardly extending flanges 34 and through which the air, which has been heated by passing through said chamber 44 and coming in contact with the intermediate or heating wall 38, is discharged into the room in which the furnace is located, and such heated air will immediately rise and will force the cool air in the room downward where it will again enter the chamber 44 through the opening 46 so that a continual circulation of the air in the room will be had.

The hopper 11 has its lower wall 11' inclined as shown in Fig. 2, and an extension 48 at the same inclination extends downward in close proximity with the outer edges of the channel bars 23 on the rotating grate and at a point near the vertical center line of said grate passing through the trunnions 19 so that as the fuel 13 feeds downward when the fire bed 49 requires it, the fuel will turn or rotate the grate 21 by reason of the angle at which it engages the channel members 23 and said channel members will automatically drop the ashes through the space 51 between said members and the corrugated heating wall 28 and into the ash chamber 16.

It will thus be seen that my improved heating device is automatic in operation and that a charge of fuel or coal may be placed in the hopper 11 and gravity alone will feed the same to the point at which combustion takes place. The ashes will be automatically discharged or expelled from the combustion chamber and the entire furnace will operate automatically so long as there is fuel in the hopper to rotate the revolving grate 21.

Experiments and commercial use of the invention have proved that a constant temperature may be maintained throughout a period of 24 to 36 hours by this automatic heating device and the only attention required will be to fill the hopper with coal. The length of time required to burn all the coal in the hopper will, of course, depend largely upon the grade of coal used, and while the fuel contemplated to be used in this heating device is bituminous, it will readily be seen that with a good grade of coal or a mixture of hard and soft coal, the length of time between chargings will be greater than in the case of ordinary run of mine coal being used.

By the gravity feed system herein employed, it has been found that the fire will confine itself to a portion of the combustion chamber 43 along the heating wall 28 so that the fire is always vertical and the fresh fuel being fed into this area will never cover the fire and choke it.

While I have shown and described in detail a preferred embodiment of my invention, it should be manifest that the invention is not limited to the details which have been selected for illustrative purposes merely, but the invention is capable of being changed and modified widely from that shown and described without departing from the essence of the invention or sacrificing any of its advantages as described in the following claims.

I claim:

1. A heating device comprising a combustion chamber, an ash chamber. a rotary grate between said chambers, and a gravity slide for feeding fuel into said combustion chamber, said grate being rotated by the

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movement of said fuel for depositing the ashes in said ash chamber.

2. A heating device comprising a combustion chamber, an ash chamber, a rotary grate between said chambers, projections on said grate, and a gravity slide for feeding fuel against said projections to rotate said grate thereby supplying fuel to the point of combustion and depositing the ashes in said ash chamber.

3. A heating device comprising a combustion chamber having a heating wall, a gravity feed slide for supplying fuel whereby the combustion of said fuel is maintained in close proximity to said wall, and means operated by the feeding of the fuel for discharging the ash from said chamber.

4. A heating device comprising a combustion chamber having a wall adapted to be heated for indirectly heating a fluid medium, a gravity feed slide for supplying fuel into said chamber, and a rotary grate adjacent said wall and adapted to be rotated by movement of fuel feeding from said slide to automatically convey the fuel into close proximity to said wall.

5. A heating device comprising a combustion chamber having a wall adapted to be heated, an ash chamber, a rotary grate between said chambers, a gravity slide for feeding fuel onto said grate to rotate the same whereby said fuel is carried to the place of combustion and the solid products of combustion deposited in said ash chamber, and a second wall contiguous to and spaced from the first said wall to provide a heating chamber for indirectly heating a fluid heating medium.

6. A heating device comprising a combustion chamber, an ash chamber, a rotary grate between said chambers, a gravity slide for feeding fuel into said combustion chamber, said grate being rotated by the movement of said fuel, thus carrying said fuel to the point of combustion and depositing the ashes in the ash chamber, and baffles in the upper part of said combustion chamber for confining the heat units therein.

7. A heating device comprising a combustion chamber, an ash chamber, a rotary grate between said chambers, a hopper for charging said furnace having an inclined bottom, an inclined plate in said combustion chamber which together with said inclined bottom forms a gravity feed chute for said fuel, said grate being adapted to be rotated by the movement of said fuel whereby said fuel is carried to the desired point of combustion and the ashes deposited in said ash chamber.

8. A heating device comprising a combustion chamber having a substantially vertical wall adapted to be heated, an ash chamber, a rotary grate between said chambers and cooperative with said wall to support fuel therebetween, and a gravity slide cooperative with said rotary grate for feeding fresh fuel toward said wall whereby combustion of the fuel is confined to an area immediately adjacent said wall.

9. A heating device comprising a combustion chamber having a wall adapted to be heated, means for supplying fuel to said chamber, and means for receiving fuel from said supply means, for supporting the same adjacent said wall until burned, and for confining the area of burning fuel to an area immediately adjacent said wall.

10. A heating device comprising a combustion chamber having a wall adapted to be heated for indirectly heating a fluid, an ash chamber beneath said combustion chamber, means for supplying fuel into said chamber, and a grate pivotally supported adjacent and cooperative with said wall for receiving fuel from said supply means and for supporting the fuel above said ash chamber, and movable about its pivot under the influence of the weight of fuel received thereon for dropping solid products of combustion into said ash chamber.

11. A heating device comprising a combustion chamber, a fuel hopper, a rotary grate and means for feeding fuel tangentially to said grate whereby to rotate the same automatically.

12. A heating device comprising a combustion chamber, a substantially cylindrical grate rotatably supported therein, a wall forming a portion of said combustion chamber adjacent said grate at one side thereof, and means substantially opposite said wall for supplying fuel by gravity onto the grate and toward said wall, said wall and grate being constructed, proportioned, and arranged to confine the area of combustion to a place adjacent said wall, and said grate being rotated under the influence of the gravity feed of fuel at a rate to maintain a substantially constant quantity of fuel at said place of combustion.

In witness of the foregoing I affix my signature.

JOSEPH A. MASONICK.