Oct. 28, 1924.

1,513,600

G. S. KENT

BOILER FURNACE

Original Filed April 2, 1921 2 Sheets-Sheet 1

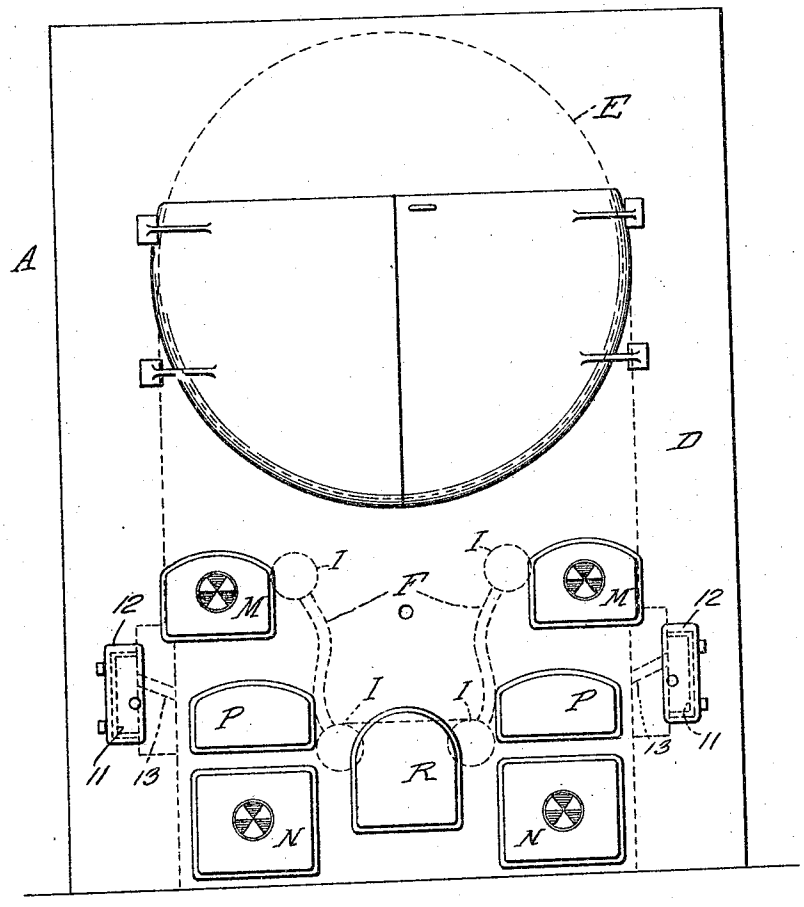


Fig. 1.

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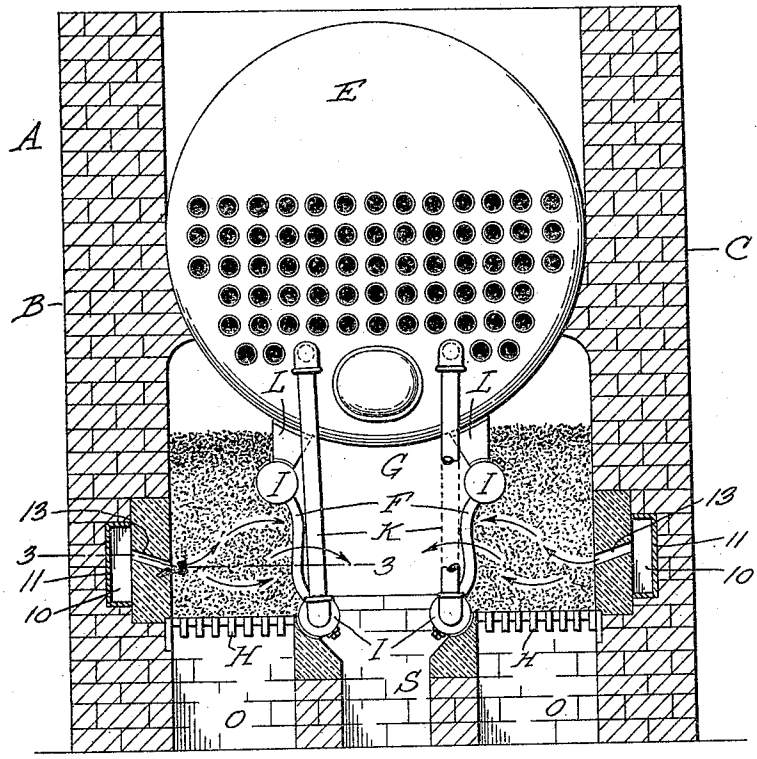
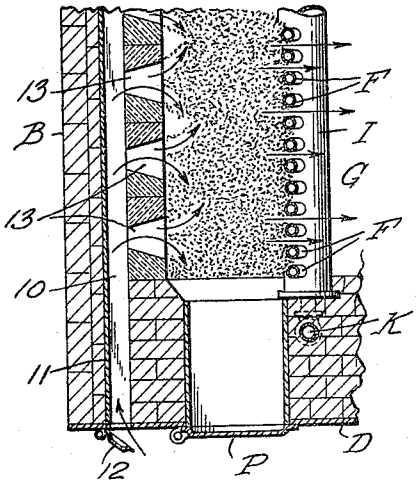


Fig. 2.

Fig. 3.



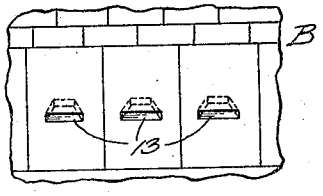


Fig. 4.

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UNITED STATES PATENT OFFICE.

GEORGE S. KENT, OF BUFFALO, NEW YORK.

BOILER FURNACE.

Original application filed April 2, 1921, Serial No. 458,067. Divided and this application filed February 1, 1923. Serial No. 616,378.

To all whom it may concern:

Be it known that I, GEORGE S. KENT, a citizen of the United States, residing at Buffalo, in the county of Erie and State of New York, have invented a new and useful Improvement in Boiler Furnaces, of which the following is a specification.

This invention relates to boiler furnaces.

The objects of the invention are to provide a furnace having improved draft means whereby a more perfect combustion of the fuel is obtained, and further, to provide improvements in boiler furnaces in the other respects hereinafter described and claimed.

The invention as illustrated, is embodied in a boiler furnace of the type shown in my application for patent Serial No. 458,067 filed April 2, 1921, of which this application is a division, but it is to be understood that the invention of this present application is not limited to a furnace of this particular type but is adapted for use in connection with other types of furnaces and other boiler structures.

In the accompanying drawings:

Fig. 1 is a front elevation of a boiler furnace embodying the invention.

Fig. 2 is a sectional elevation thereof.

Fig. 3 is a fragmentary horizontal section thereof on line 3—3, Fig. 2.

Fig. 4 is an elevation of a portion of one of the inner walls thereof.

A represents a boiler furnace having side walls B and C respectively, and a front wall D. E represents a fire tube boiler mounted in the furnace and F are water tubes forming substantially vertical water grates at opposite sides of a central combustion space G. H designates horizontal fire supporting grates and I are suitable water drums or tubular headers connecting the water tubes F, the lower water drums or headers being connected with the boiler by means of risers K. L designates refractory spacing blocks or fire bricks which close the space between the upper water drums and the boiler.

M designates a pair of fuel doors disposed at opposite sides of the furnace front, through which fuel is supplied to the grates and through which air may be admitted above the fuel on said grates, and N designates a pair of cleanout and draft doors through which access may be had to the ash pits O. P designates a pair of doors which doors permit access to the grates to allow the customary use of slicing bars or similar devices, and R designates a door opening into a central or auxiliary ash pit S.

This invention provides means for introducing a ventilating fluid or air or other combustion supporting fluid into the sides of the masses of fuel upon the grates for the purpose of promoting the combustion of such fuel, preferably in such manner that the air or other fluid so introduced is forced to travel through the mass of fuel into which it is introduced before it reaches the combustion space. In the preferred means for accomplishing this object, illustrated, the side walls of the furnace are provided with conduits or passage-ways 10 which extend substantially lengthwise of the boiler and which may be formed, as shown, by the introduction of a channel beam 11 into a suitable recess in each of the side walls of the furnace. Each conduit 10 is open at one end and the admission of air or other fluid thereto is controlled by suitable means, such for example as a door 12 or the like. These conduits or passage-ways are in communication with the fire chambers and the masses of fuel upon the grates through a suitable number of air admission or draft openings 13 whereby air is admitted from the air conduits directly into the sides of the masses of the fuel on the grates. In the preferred form illustrated, these draft or air admission openings preferably taper from the inner sides of the side walls to the air or draft conduits 10, that is to say, the openings are provided with enlarged mouths whereby air passing into the fuel from the air conduits is caused to spread out and diffuse as it enters the mass of fuel. As best illustrated in Fig. 2 of the drawings, these draft openings preferably extend inwardly and downwardly which prevents to a certain extent the filling of these openings with ashes or other obstructions.

The introduction in this manner of air into the sides of the masses of fuel upon the grates encourages a very complete combustion, it initiates and maintains a draft of air through the entire mass of fuel from side to side, effectively carrying the unconsumed gases out into the central combustion space where they are consumed, and by supplying air to the heated fuel at all times renders the gases as they are formed more susceptible to perfect combustion and

results in the effective and most intimate admixture necessary to cause complete combustion of the gases and smokeless operation of the boiler.

I claim as my invention:

1. In a boiler furnace in combination with a housing having side walls and a relatively central combustion space, a pair of grates, one at each side of said central combustion space, and means in the side walls of said housing for introducing air laterally into the masses of fuel supported on said grates whereby the air from said means passes laterally through the masses of fuel into the combustion space.

2. In a boiler furnace in combination with a housing having side walls and a relatively central combustion space, a pair of grates, one at each side of said central combustion space, an air conduit arranged in each of said side walls lengthwise of the boiler, and air inlet passages from said conduit into said furnace adapted to supply air directly to the sides of masses of fuel on said grates at the sides thereof remote from said combustion space.

3. In a boiler furnace in combination with a housing having side walls and a relatively central combustion space, a pair of grates, one at each side of said central combustion space, an air conduit arranged in each of said side walls lengthwise of the boiler, and air inlet passages from said conduit into said furnace adapted to supply air directly to the sides of masses of fuel on said grates, said air inlet passages extending lengthwise of the furnace and tapering outwardly toward said conduit.

4. In a boiler furnace in combination with a housing having side walls and a relatively central combustion space, a pair of grates, one at each side of said central combustion space, an air conduit arranged in each of said side walls lengthwise of the boiler, and air inlet passages from said conduit into said furnace adapted to supply air directly to the sides of masses of fuel on said grates, said air inlet passages extending inwardly and downwardly from said conduit and having their discharge openings extending lengthwise of the furnace.

5. In a boiler furnace in combination with a housing having side walls and a relatively central combustion space, a pair of grates, one at each side of said central combustion space, an air conduit arranged in each of said side walls lengthwise of the boiler, and air inlet passages from said conduit into said furnace adapted to supply air directly to the sides of masses of fuel on said grates, said air inlet passages extending inwardly and downwardly from said conduit and the discharge ends of said passages being of greater dimension lengthwise of the furnace than the other ends thereof.

6. In a boiler furnace having a central combustion space, the combination of a pair of grates spaced apart and extending lengthwise beneath the boiler and adapted to support masses of fuel, means for introducing air above and below said grates, and means for introducing air into the sides of masses of fuel supported on said grates opposite to said combustion space.

7. In a boiler furnace having a central combustion space beneath the boiler, the combination of a pair of grates for supporting masses of fuel at opposite sides of said combustion space, and means for introducing air into the sides of said masses of fuel opposite said combustion space, whereby the air is forced to travel laterally through said masses of fuel to reach said combustion space.

8. In a boiler furnace having a central combustion space beneath the boiler, the combination of a pair of grates for supporting masses of fuel at opposite sides of said combustion space, and means for diffusing air into the sides of said masses of fuel upon said grates opposite to said combustion space.

GEORGE S. KENT.