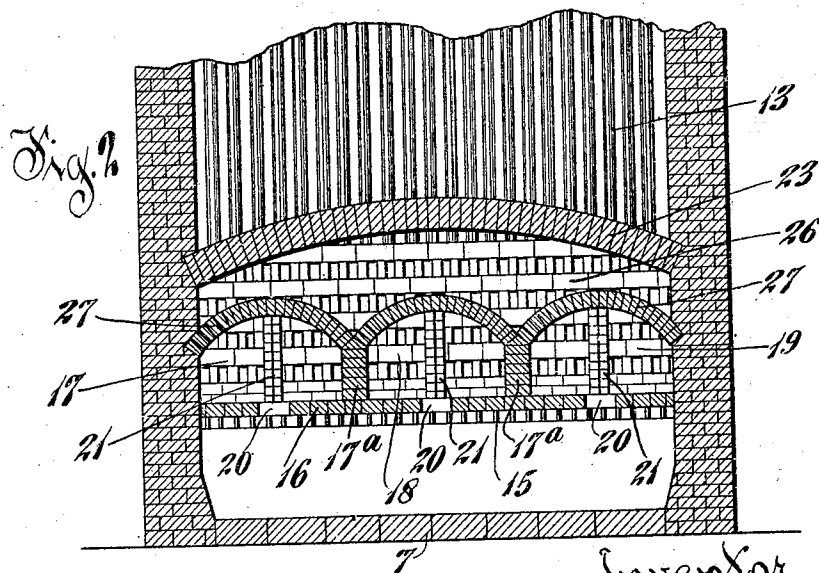
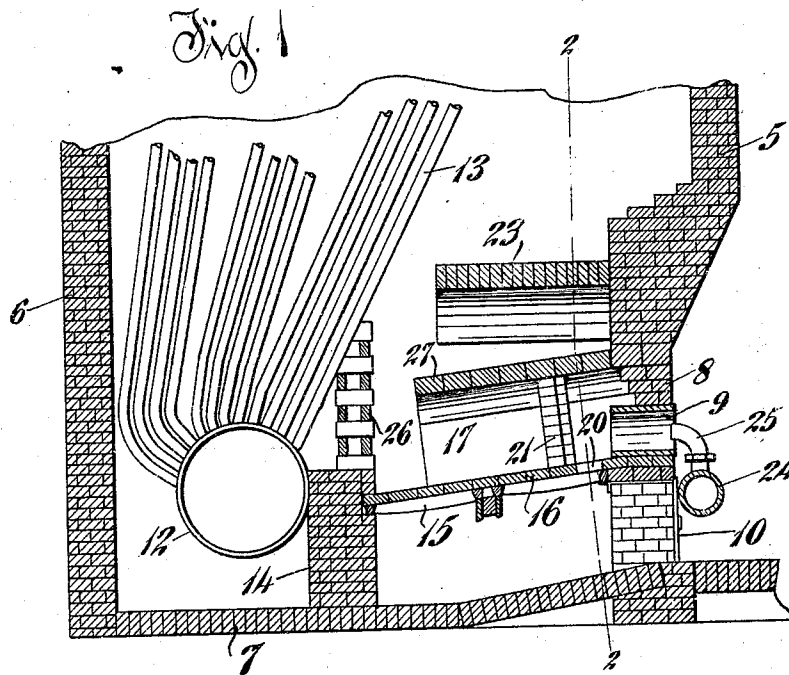


F. WAGNER.
STEAM BOILER FURNACE.
APPLICATION FILED JUNE 7, 1909.

Patented Oct. 26, 1909.
2 SHEETS—SHEET 1.

937,898.



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Fig. 3

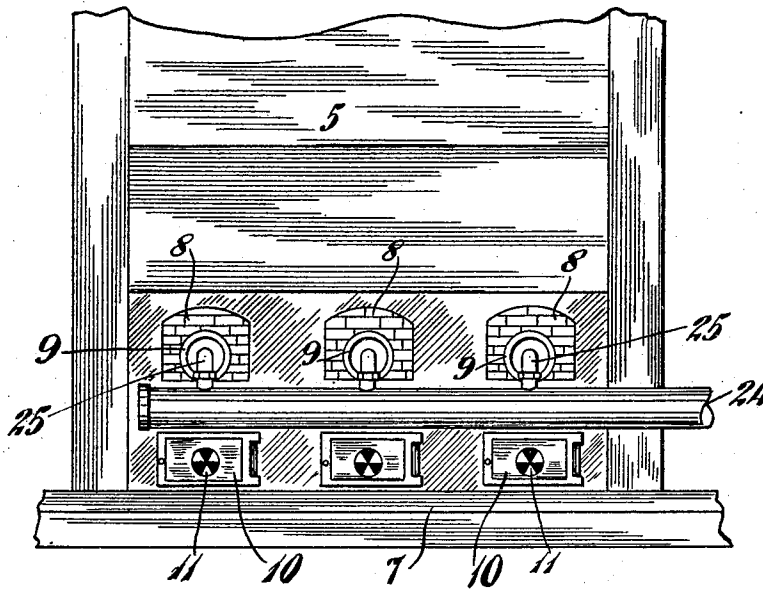
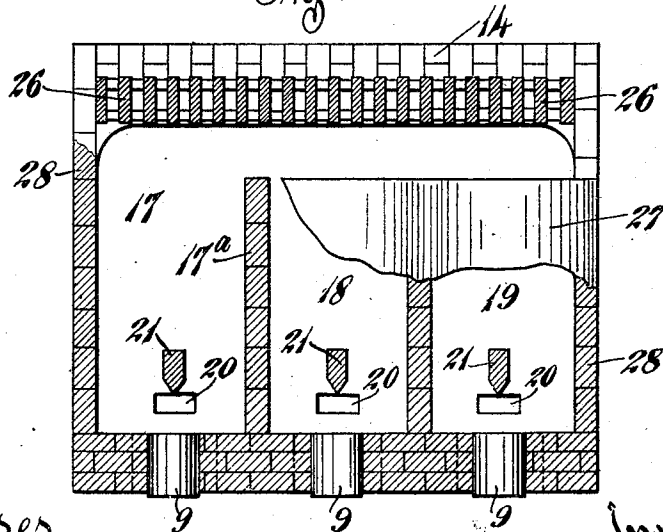


Fig. 4



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UNITED STATES PATENT OFFICE.

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STEAM-BOILER FURNACE.

937,898.

Specification of Letters Patent.

Patented Oct. 26, 1909.

Application filed June 7, 1909. Serial No. 500,632.

To all whom it may concern:

Be it known that I, FRANK WAGNER, a citizen of the United States, residing at Newport, in the county of Campbell and State of Kentucky, have invented certain new and useful Improvements in Steam-Boiler Furnaces, of which the following is a specification.

My invention relates more particularly to a natural gas furnace equipment for a boiler which is adapted to be heated by coal.

The object of my invention is to provide means whereby a boiler which has been adapted to the use of coal can very easily and quickly be converted into a boiler using natural gas as means of heating it.

My invention consists of a separate fire box built or placed directly above the grating upon which the coal has been placed, and it is this particular fire box that I wish to describe specifically.

My invention also consists in certain new and useful combination of parts which will be more particularly described in the following specification and pointed out in the appended claim.

In the drawings: Figure 1 shows a cross sectional elevation of a common ordinary type boiler, the top being broken away. Fig. 2 is a sectional view taken on the line 2-2 of Fig. 1. Fig. 3 shows a front elevation of the boiler. Fig. 4 shows a plan sectional view of my new improved fire box.

Referring more particularly to the drawings, I show at 5 the front wall on the boiler, the back wall 6 and the floor 7. In the front wall 5 I show a fire door leading to the fire box closed up with brick 8 with the exception of a small opening through which a pipe 9 extends. At 10 I show the common type of door leading to the ash pit, this door having a draft opening 11 adapted to be closed or opened as far as desired. At 12 I show the common type water tank, or mud drum, with a series of pipes 13 leading therefrom. The common bridge wall found in all boilers of this kind I show at 14, having the grate bars 15 resting thereon. The grate bars 15 extend from the bridge wall over to the front walls 5. It is seen that in my new improved fire box, I provide a floor 16 which is laid directly upon the grate bars 15. My fire box, in this case, consists of three separate compartments 17, 18 and 19. Each compartment is directly behind a pipe 9, the

three pipes 9, 9, 9 being more clearly shown in Fig. 3. Directly behind the pipe 9 I leave a small opening 20 in the floor 16. The purpose of this hole will be more thoroughly described hereinafter. 23 shows the arch built of brick which is usually found in this style of boilers when using coal as a fuel. This, however, is not necessary with my style fire box, as it is readily seen that my fire box can be built beneath the arch 23.

The operation of the system is as follows: When the gas coming from pipe 24 is fed through pipe 25 to pipe 9 it immediately begins to mix with the proper amount of air, which, of course, is necessary before the gas will burn. The gas, upon leaving the pipe 9, also mixes with air which enters through opening 20 and as it passes backward it is seen that the column 21 tends to divide the volume of gas and air, thereby mixing it considerably and distributing the volume more thoroughly throughout the divisions 17, 18 and 19 of my fire box. As the volume of gas and air passes farther backward it comes in contact with a net work of what is commonly called checker work 26 built upon the bridge wall 14. This wall of checker work is here to perform several functions, one of which is to more thoroughly mix the gas and more evenly distribute it through the pipes 13. The wall 26 will also retain a great amount of heat, thereby keeping the lower end of the pipes 13 hot. As the heat passes through the checker work 26 and into the pipes 13 it takes its usual course to the top of pipes 13 and down the other series of pipes and out of the flue which is commonly provided in these type boilers.

It is seen that by providing a roof or cover 27 to each division 17, 18 and 19 of my fire box that I keep the heat and gas from collecting under the arch 23 which, as stated before, is used when coal is in use as a fuel. I also extend the roof or cover 27 parallel with the grate bars 15 which are slightly lower at their inner ends, thus making the cover 27 lower also. In this manner I keep the heat down as much as possible, which has been found very desirable in this style of equipment. Of course, it is not necessary to have three divisions in this style fire box but I have shown three because this number is very commonly used.

Referring more particularly to Fig. 4 of

the drawings, where I show my new improved fire box on a slightly larger scale and in plan, I also show the side walls 28 which may or may not be used. By using
5 walls 28 it is seen that I make the fire box complete in itself, and all there is needed to be done is to place the fire box directly upon the grate bars of the old fire box. In
10 Fig. 4 I also show the partitions 17^a which divide the fire box into the three divisions 17, 18 and 19. I also show the cover more plainly and in plan, said cover being broken away for the sake of clearness. The checker work
15 26 is shown built upon bridge wall 14. The opening 20 is also shown directly behind the pipe 9 and in front of the brick column 21. When it is desired to regulate the amount of air which comes through the opening 20, I provide the opening 11 or
20 shutter as it might be called in the door 10. This shutter may be arranged to open and close as much as desired.

My invention may be modified in various ways without departing from its spirit and scope, and I do not wish to be confined to
25 the exact details shown.

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

In a steam boiler furnace adapted to use gas as fuel, having fire brick floor and walls
30 and divided by vertical walls making a series of combustion or fire chambers, each chamber having a vertical column placed behind an air opening in the floor, said
vertical columns dividing the combustion
35 particles in such a manner as to cause them to spread throughout the fire chamber, and a brick wall built with suitable openings for equalizing and retaining heat and placed behind said fire chambers.

FRANK WAGNER.

Witnesses:

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