(No Model.)

F. G. GIRTANNER.

FURNACE.

No. 575,421. Patented Jan. 19, 1897.

Fig. 1

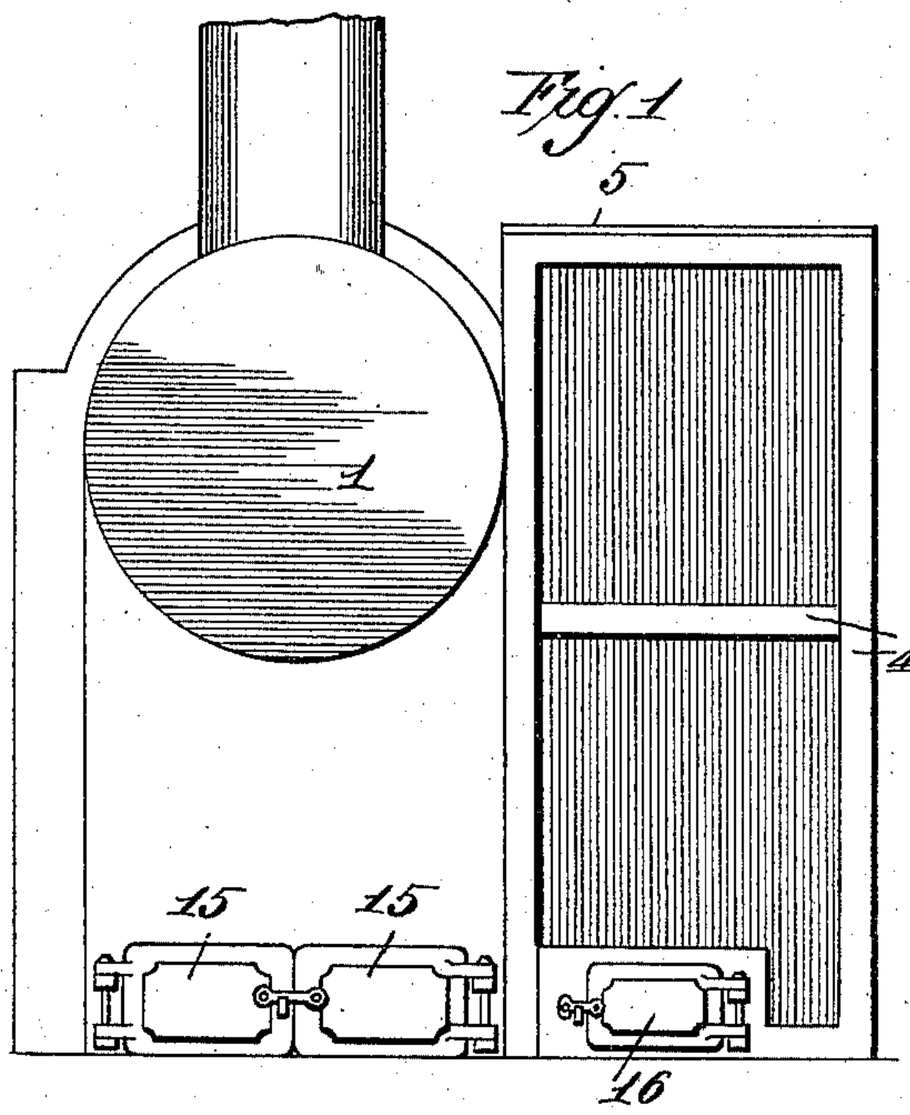


Fig. 2

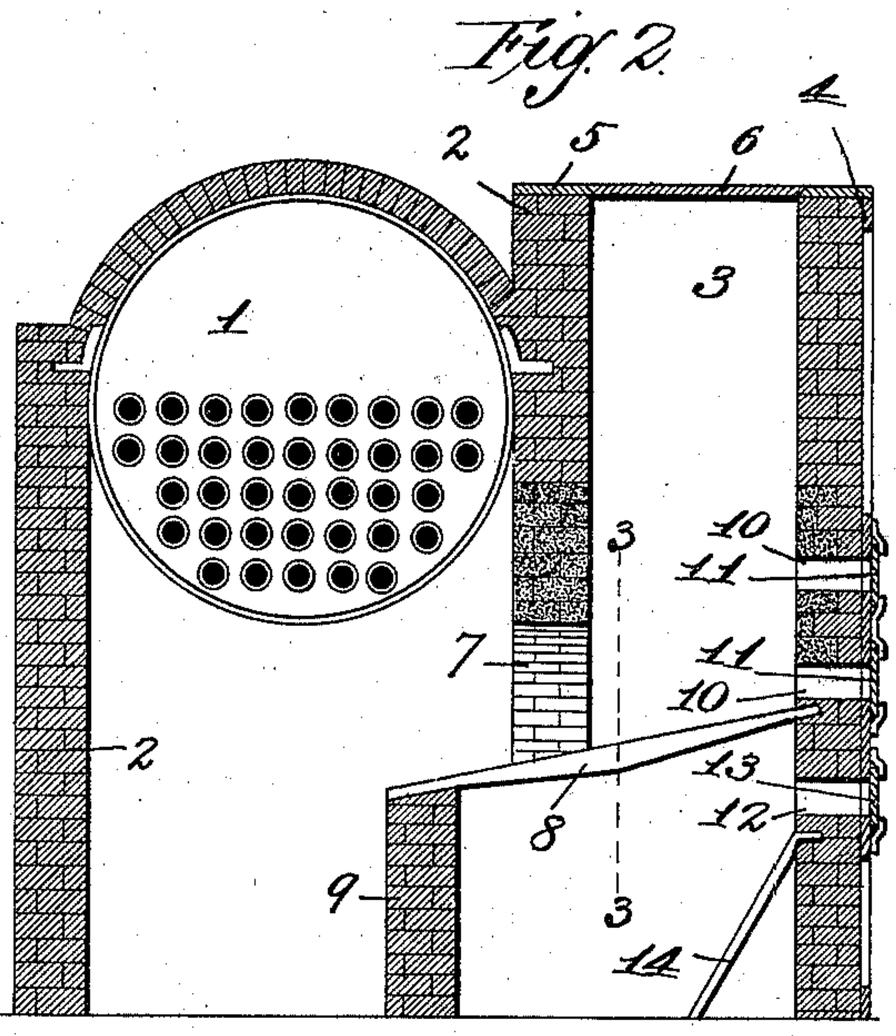


Fig. 3

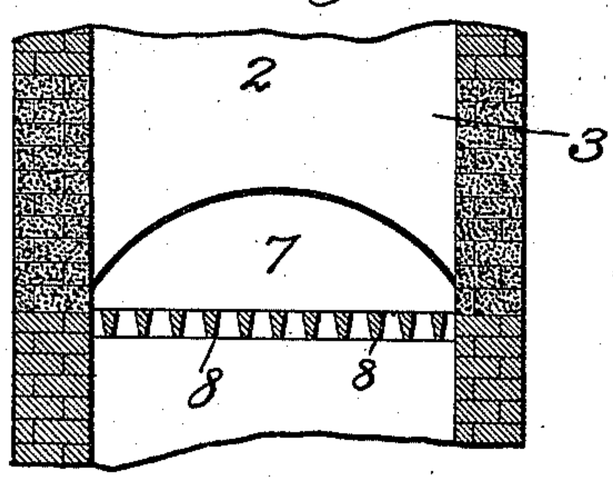
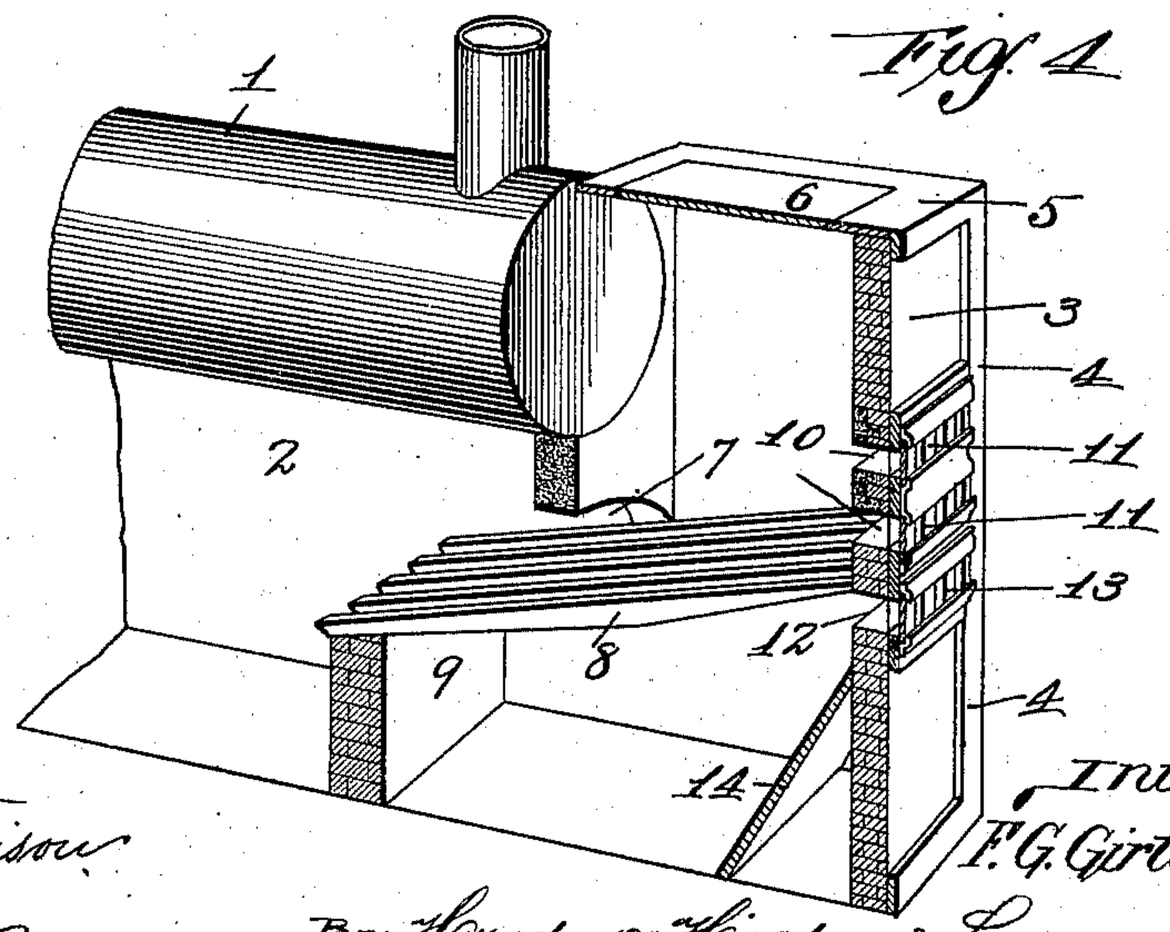


Fig. 4



Attest
John L. Tunison
W. P. Smith

Inventor:
F. G. Girtanner.
By Higdon & Higdon & Longan Attys.

UNITED STATES PATENT OFFICE.

FRED G. GIRTANNER, OF ST. LOUIS, MISSOURI, ASSIGNOR TO THE KOCH-ERSPERGER-HALLAM HEATING CO., OF KANSAS CITY, MISSOURI.

FURNACE.

SPECIFICATION forming part of Letters Patent No. 575,421, dated January 19, 1897.

Application filed December 27, 1895. Renewed December 7, 1896. Serial No. 614,833. (No model.)

To all whom it may concern:

Be it known that I, FRED G. GIRTANNER, of the city of St. Louis, State of Missouri, have invented certain new and useful Improvements in Smoke-Consuming Furnaces, of which the following is a full, clear, and exact description, reference being had to the accompanying drawings, forming a part hereof.

My invention relates to an improved smoke-consuming furnace; and it consists in the novel construction, combination, and arrangement of parts hereinafter described and claimed.

In the drawings, Figure 1 is a front elevation of a smoke-consuming furnace constructed in accordance with my invention. Fig. 2 is a transverse sectional view taken through the fire-box and front end of the boiler of my improved furnace. Fig 3 is a detail vertical sectional view taken approximately on the indicated line 3 3 of Fig. 2. Fig. 4 is a sectional perspective view of a modified form of my improved furnace.

Referring by numerals to the accompanying drawings, 1 indicates the boiler, the same being set between the walls 2 2 in the usual manner. Built at the forward end of the boiler-setting, immediately to one side of the point usually occupied by the fire-box, is a rectangular magazine 3, the same being held together by suitable metallic straps 4, and upon top of said magazine is located a plate 5, the same being provided with a hinged door 6. Formed in the side wall 2 of the boiler-setting, in a plane below the plane occupied by the bottom of the boiler 1, and connecting the interior of the magazine 3 with the chamber beneath said boiler 1, is an arched opening 7. Grate-bars 8 of any suitable construction are embedded at one end in the outside wall of the magazine 3 and extend from thence downwardly through the arched opening 7 and into the chamber beneath the boiler 1, and said grate-bars 8 are supported at their inner ends by a wall 9, analogous to the bridge-wall of an ordinary furnace.

Formed in the outside wall of the magazine 3, at points above the upper ends of the grate-bars 8, are apertures 10, the same being closed by ordinary dampers 11, the same being arranged to slide upon the face of the outside wall of said magazine. Formed in said wall, at a point immediately below the upper ends of said grate-bars, is a series of apertures 12, the same being normally closed by an ordinary slide-damper 13. Embedded in the inner face of the outside wall of the magazine, at a point immediately below the series of apertures 12, is the upper end of a deflector or inclined plate 14, the lower end of which rests upon the ground-line of the furnace.

Arranged in the front wall of the furnace, at a point immediately below the boiler, is a pair of doors 15, and arranged in the front wall of the magazine 3, and at a point below the grate-bars 8, is a door 16.

In the modification shown in Fig. 4 the general construction of the furnace as hereinbefore described is carried out, with the exception that the magazine 3 is located immediately in front of the boiler, the arched opening being immediately below the front end of said boiler, and the rear ends of the grate-bars rest directly upon the transversely-arranged bridge-wall. In this construction the openings 10 and 12 are arranged in the front wall of the magazine 3 instead of in the side wall, as in the preferred form of the furnace.

The portions of the walls of my improved furnace that are subjected to the greatest heat may be, if desired, constructed of fire-brick, these portions being shown by the stipple shading in the drawings.

In the practical use of my improved smoke-consuming furnace, after the magazine has been filled or partially filled with fuel, the fire is started upon the ends of the grate-bars that rest upon the bridge-wall 9. The products of combustion from said fire will pass rearwardly through the ends of the grate-bars, through the chamber beneath the boiler 1, and from thence into the boiler-tubes at their rear ends, through said boiler-tubes, and into the smoke-stack in the usual manner. The fire after once being started will necessarily coke or char the fuel at the upper ends of the grate-bars and in the lower end of the magazine, and the gases and smoke produced by said coking or charring will be carried into the fire or bed of coals located upon the forward ends of the grate-bars and thereby be consumed. The combustion of said smoke

and gases necessarily produces an intense heat, which is very effective in heating the water within the boiler. Draft to the fire is obtained by opening or moving the slides that cover the apertures 10 and 12. Should fuel in the lower end of the magazine become so coked or charred as that it will not readily feed onto the grate-bars, a poker or like instrument may be passed through either of the series of apertures 10 and said coked portion so broken or disintegrated as that it will readily feed downwardly onto said grate-bars. The fine ashes will pass downwardly through the grate-bars into the ash-pit, from whence they may be removed through the door 16, while the clinkers and the like will pass from the ends of the grate-bars 8 to the floor of the chamber beneath the boiler 1, where they may be removed through the doors 15.

A furnace of my improved construction may be used as a hay or straw burner or as a garbage-furnace, as well as an ordinary furnace using coal as a fuel, and said furnace is easily and cheaply constructed, can be applied to boilers already set and in position, is extremely economical in the use of fuel of any kind, and by its peculiar construction will readily consume all the smoke and gases and like products of combustion arising from the charring fuel, and by so doing the entire heat-giving properties of the fuel are utilized.

I claim—

The combination with a boiler 1 set between the walls 2, 2, in the usual manner, of a furnace comprising the rectangular magazine 3, located to one side of the front end of the boiler-setting and composed of a suitable wall parallel with the walls 2, 2, of the boiler-setting, the metallic straps 4 to hold said magazine together, the plate 5 on top of said magazine, the hinged door 6 in said plate, the dividing wall 2 having the arched opening 7, the grate-bars 8 embedded at one end in the outside wall of said magazine and extending from thence downwardly through the arched opening 7, and into the chamber beneath the boiler 1, the wall 9 supporting the inner ends of said grate-bars, the dampers 11 closing the apertures 10 in the outside wall of the magazine 3 and above the end of said grate-bars 8, the damper 13 closing the apertures 12 in said wall and below the ends of said grates, the inclined plate 14 embedded in the inner face of the outside wall of the magazine, the pair of doors 15 in the front wall of the furnace at a point immediately below the boiler, the door 16 in the front wall of the magazine at a point below the grate-bars 8, and suitable front and rear walls to said furnace and magazine, substantially as and for the purposes stated.

In testimony whereof I affix my signature in presence of two witnesses.

FRED G. GIRTANNER.

Witnesses:
E. E. LONGAN,
JOHN C. HIGDON.