J. A. FRANCOEUR.

FURNACE.

APPLICATION FILED JULY 28, 1917.

1,295,473.

Patented Feb. 25, 1919.

2 SHEETS—SHEET 1.

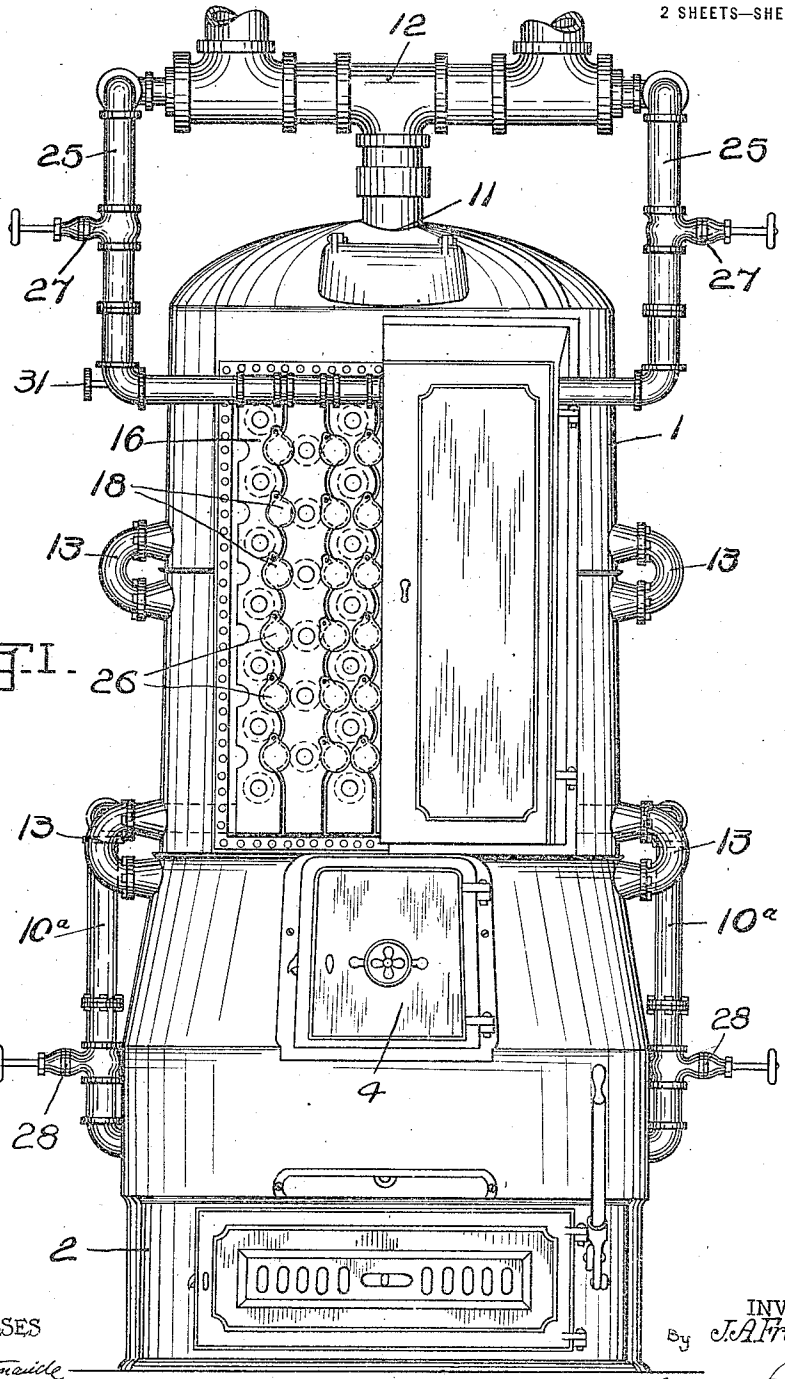


FIG. 1.

WITNESSES

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2 SHEETS—SHEET 2.

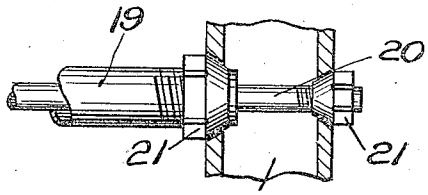


FIG. 3.

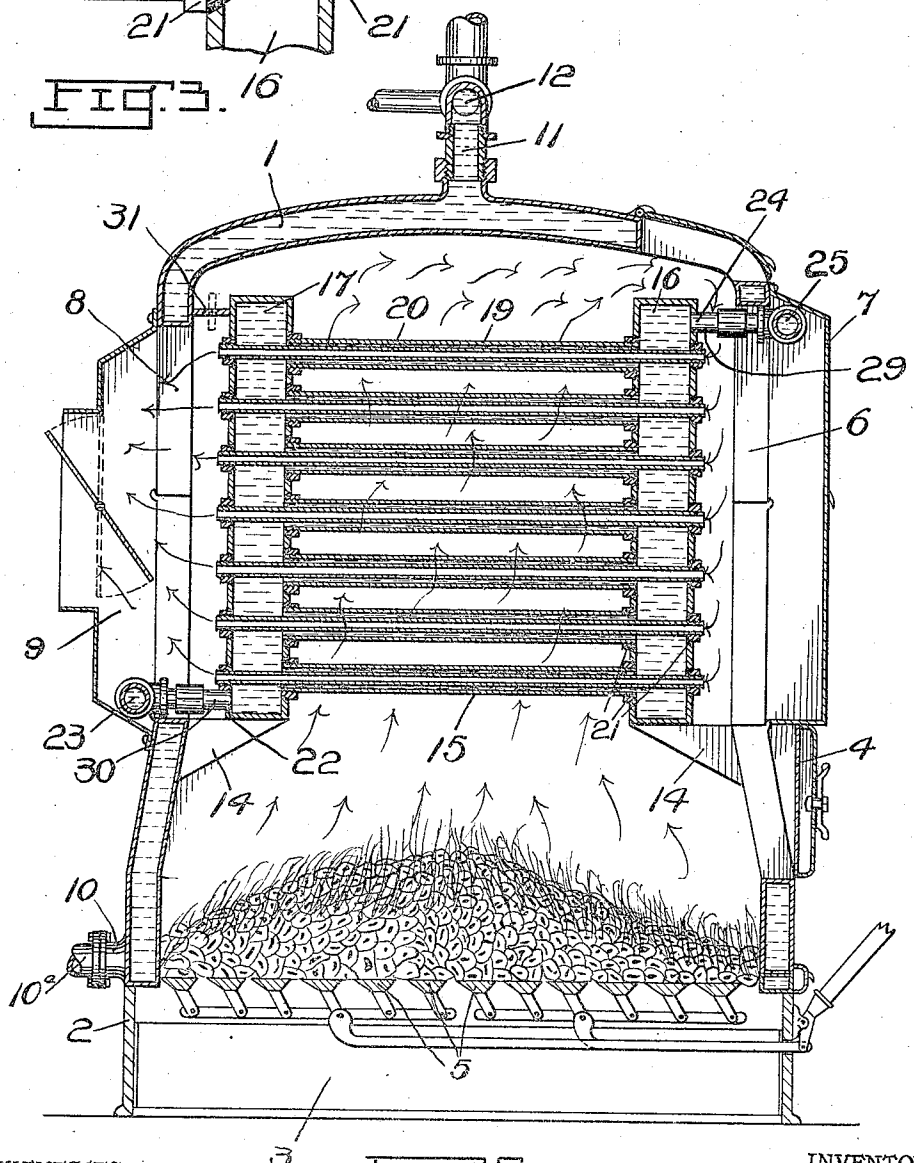


FIG. 2.

WITNESSES

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UNITED STATES PATENT OFFICE.

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FURNACE.

1,295,473. Specification of Letters Patent. Patented Feb. 25, 1919.

Application filed July 28, 1917. Serial No. 183,275.

To all whom it may concern:

Be it known that I, JOSEPH ACHILLE FRANCOEUR, a subject of the King of Great Britain, and residing at 509 Delanaudiere street, in the city of Montreal, in the Province of Quebec, in the Dominion of Canada, have invented certain new and useful Improvements in Furnaces; and I do hereby declare that the following is a full, clear, and exact description of the same.

The invention relates to improvements in a "furnace" and consists of a water jacketed casing with a number of independent vertical water headers in pairs connected by a plurality of inner and outer tubes.

The object of the invention is to provide a furnace where it is possible to withdraw one section at a time without interfering with the other sections, for repair purposes, and at the same time without extinguishing the fire. A further object of the invention is to provide a greater surface in the smallest space possible, as well as provide a furnace that will be practically smokeless as the greater portion of the combustible gases will have sufficient time to burn before escaping through the chimney.

The furnace is here illustrated as being water jacketed all around and divided into sections. This has been done in case it would be impossible to cast the furnace in one or two sections.

In order that there may be a water circulation through the water jacketed sections, the drawing discloses outside connections between each section and the next.

In case it would be necessary to have the water jacketed furnace casing, these outside connections would have to be eliminated, as well as if the casing were cast in one piece.

In the drawings, Figure 1 is a front elevation of the invention, one of the doors having been removed, thus showing the arrangement of the independent water headers.

Fig. 2 is a cross section through the middle of the furnace, looking from one side, showing the disposition of the water sections.

Fig. 3 is an enlarged detail view of the means to secure the tubes to the water headers.

Like numerals of reference indicate corresponding parts in each figure.

In the drawings:—

1 is the casing of the furnace, made in sections and here shown as water jacketed. 2 is the base which supports the water jacketed sections, and 3 is the ash pit. 4 is the fire box. 5 is the grate.

6 is an opening in the front part of the furnace, closed by the door 7, and 8 is the smoke outlet suitably connected to the chimney by the cap 9 secured over said outlet. The lowest water jacketed section 1 is provided with a water inlet 10, to which is connected the pipe 10^a, and the top section is provided with a vertical water outlet 11 which leads upwardly from the center of the dome portion of said top section and opens into the horizontally-arranged header 12. Each section is suitably connected by the semi-circular connecting pipes 13.

The casing of the furnace is here illustrated as being composed of three water jacketed sections suitably connected together; but, without departing from the invention, a casing having a water circulation therearound would serve the same purpose.

14 are brackets secured to the inner side of said water jacketed casing above the fire box, and 15 indicates a plurality of vertical adjacent water columns supported at each end on said brackets 14 within the furnace casing and a part of the fire pot. The said water columns 15 consist of two vertical castings 16 and 17, preferably provided with dents or slots 18. 19 are tubes connecting the inner walls of said casings 16 and 17 and having their ends secured to said walls by means of threaded plugs or nuts 21, and 20 are smaller tubes passing through said tubes 19 and connected at their outer ends to the outer walls of said casings 16 and 17 in like manner by plugs or nuts 21, and projecting through said walls.

These threaded plugs or nuts 21 are thought to be the most convenient way of properly connecting the casing and tubes together.

It will be here clearly seen that the tube 19 is connected with the casings 16 and 17, while the tube 20 projects through both of said casings and establishes an air circulation therethrough, which will cause the unburnt gases to pass through said tubes 20 and then through said outlet 8 into the chimney.

The said casing 17 is provided with the water inlet 22, to which is connected the pipe 23; and 24 is a water outlet, provided in the

casing 16 and to which the pipes 25 are connected at one end, the said pipes 25 being connected at the other end to the header 12.

Were the columns 15 placed side by side, the openings 18 would form draft holes that would draw the gases. In order to prevent this, caps 26 are provided, which may be used to close the tubes 19 at their front ends. 27 and 28 are valves suitably connected with the pipes 25 and 10^a respectively. The two columns 15 are connected to the pipes 23 and 25 by means of the individual pipes 29 and 30.

This furnace has been so devised that if one of the water columns leaks or has to be repaired it may be taken out without extinguishing the fire and without removing the complete set of water columns, by merely increasing the pipe connections 29 and 30 and pulling out the column through the door 7 in the front part of the furnace. Moreover, this furnace is so designed as to offer a greater water-heating surface, while the cost of manufacture will probably not exceed that of most furnaces.

31 is a damper secured in the upper part of and between the water jacketed casing 1 and casing 17. This is provided so that when lighting the fire it may be necessary to have some powerful draft. This damper, being opened, will cause a more powerful and direct draft to pass into the chimney. When the fire is well under way, the damper 31 should be closed, as illustrated in Fig. 2 of the drawings, thus causing the fumes to follow in the direction of the indicating arrows.

What I claim is:—

In a furnace, the combination of a casing comprising a plurality of superposed, water-jacketed sections having pipe connections between them, the top section including a dome-shaped portion; a water inlet pipe leading into the bottom section; an outlet pipe extending upwardly from the center of the dome of the top section; a header extending horizontally over said dome and to which said outlet pipe is connected at its upper end; spaced front and rear vertical water column units disposed within said casing and having connecting tubes between them, a horizontal pipe within said casing extending behind the lower portion of the rear column and connected with the same; a horizontal outlet pipe within said casing extending in front of the upper portion of the front column and connected therewith, the ends of the last-named pipe projecting through the casing; and a vertical pipe leading upward from each end of said last-named pipe and connected at its upper end to said header.

Signed at Montreal, Quebec, Canada, this sixth day of March, 1917.

JOSEPH ACHILLE FRANCOEUR.

Witnesses:
F. A. BEST,
A. P. DEAL.

Copies of this patent may be obtained for five cents each, by addressing the "Commissioner of Patents, Washington, D. C."