

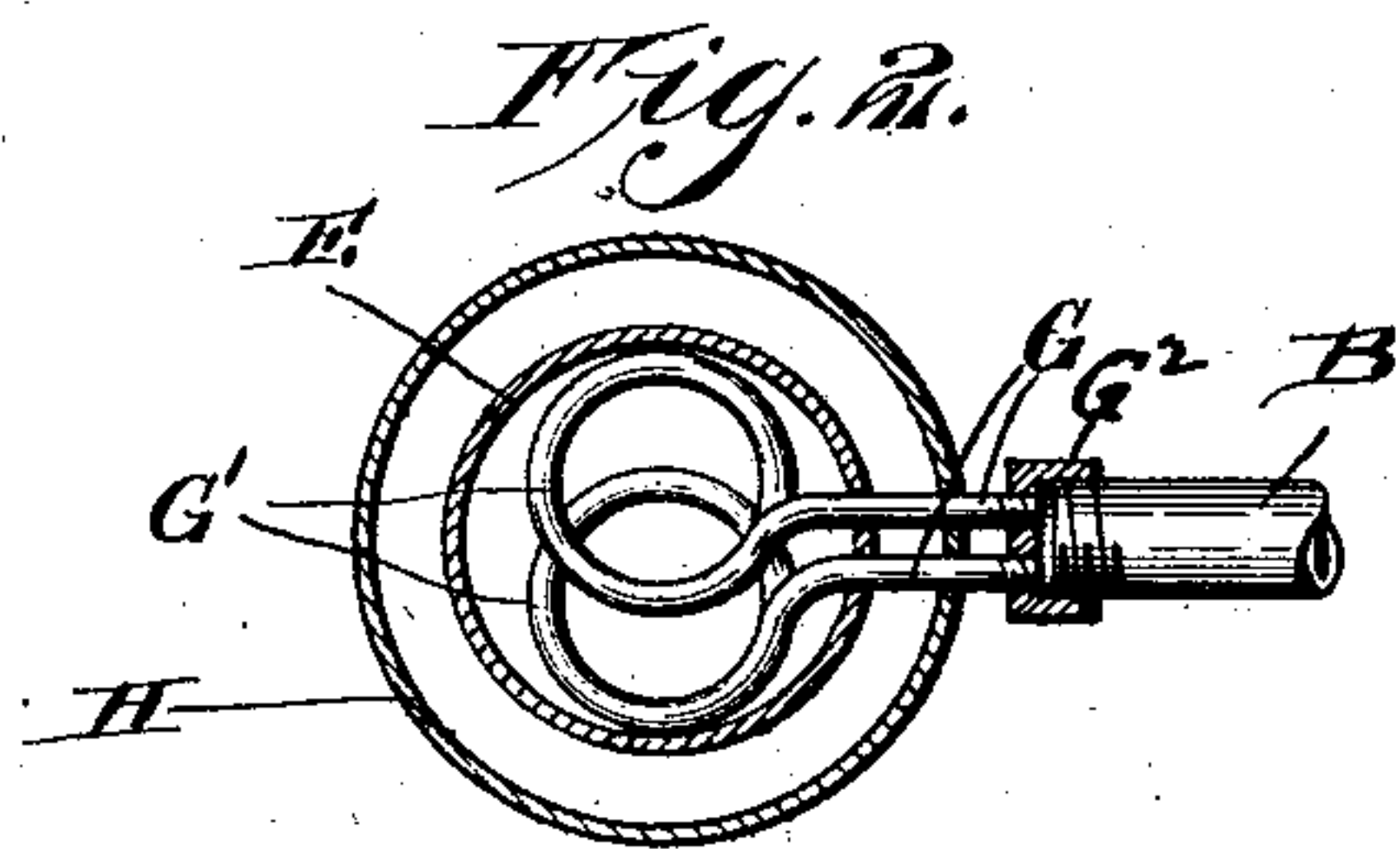
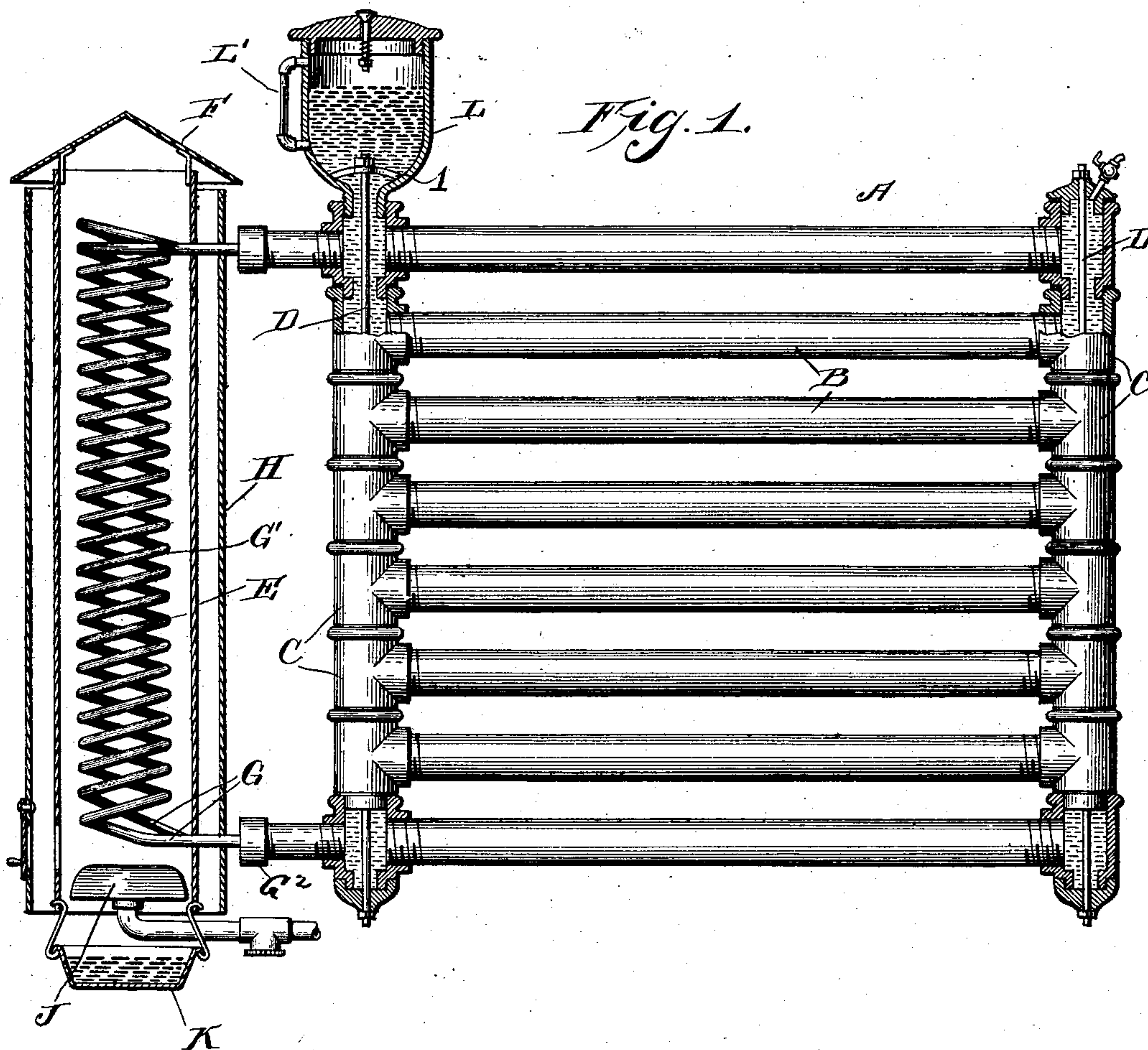
No. 756,108.

PATENTED MAR. 29, 1904.

F. G. FREESE.  
GAS HEATER.

APPLICATION FILED OCT. 27, 1902.

NO MODEL.



Witnesses:

Louis D. Heinrichs  
L. E. Morrison

Inventor  
Frank G. Freese

By *W. J. Williams*  
Atty



# UNITED STATES PATENT OFFICE.

FRANK G. FREESE, OF PHILADELPHIA, PENNSYLVANIA.

## GAS-HEATER.

SPECIFICATION forming part of Letters Patent No. 756,108, dated March 29, 1904.

Application filed October 27, 1902. Serial No. 128,885. (No model.)

*To all whom it may concern:*

Be it known that I, FRANK G. FREESE, a citizen of the United States, residing at Philadelphia, county of Philadelphia, and State of Pennsylvania, have invented a certain new and useful Improvement in Gas-Heaters, of which the following is a specification.

My invention relates to a new and useful improvement in gas-heaters, and has for its object to provide a heater in which hot water is caused to circulate through a radiator and the water is heated by a gas-burner.

With this end in view this invention consists in the details of construction and combination of elements hereinafter set forth and then specifically designated by the claim.

In order that those skilled in the art to which this invention appertains may understand how to make and use the same, the construction and operation will now be described in detail, referring to the accompanying drawings, forming a part of this specification, in which—

Figure 1 is a side elevation of my improved heater, portions of the same being broken away and shown in section for better illustration; Fig. 2, a cross-section through the heating-chamber.

In the drawings, A represents a radiator which is composed of a series of horizontal pipes B, and each end of these pipes is threaded with a water-tight connection into couplings C, and these couplings are arranged one above the other and fit into each other, so that communication is established between all of the pipes. The upper end of the upper coupling of one pile is closed with a cap, and the lower coupling of each pile is also closed at its lower end, and a bolt D is passed through all of the couplings, so that the couplings are all drawn tightly together, as shown in Fig. 1, suitable washers being placed between each coupling to prevent leakage. The expansion-chamber (to be hereinafter described) has a yoke 1, through which one bolt D passes for binding the sections of the radiator together.

E is the heating-chamber, which is preferably a vertical sheet-iron tube, and over the upper end of this tube E is arranged a cap F.

G represents small pipes connected at their

lower ends to the lower portion of the radiator and at their upper ends to the upper portion of the radiator, and these pipes G are coiled within the heating-chamber E, as shown in Fig. 1. These coils are preferably out of line with one another when viewed from above, as shown in Fig. 2, and while I have shown two pipes G it is obvious that more or less could be used. The pipes G are threaded into heads or caps G<sup>2</sup> of the upper and lower radiator-sections.

H is a sheet-iron casing surrounding the heating-chamber E and arranged at a distance therefrom, so as to leave an air-space I in between, which, being open at the top and bottom, will prevent the radiation of heat from the heating-chamber and concentrate all of the heat upon the coil G'.

J is an ordinary gas-burner arranged in the lower end of the heating-chamber E to furnish the heat for heating the coil G'.

K is a pan suspended below the gas-burner and in close proximity thereto, which pan may be filled with water, which when evaporated by the heat will cause a certain amount of moisture to be taken up by the air in the well-known manner.

L is an expansion-chamber connected with the radiator and extending upward from the upper end thereof, and this expansion-chamber is in the form of a cup with a screw-cap and is provided upon one side with a glass sight-tube L'.

The operation of my device is as follows: The screw-cap of the expansion-chamber L is removed and water is poured into the same, which water will flow through the radiator-pipes B, couplings C, and also through the pipes G until the same are filled, and water is poured in until the level will rise in the expansion-chamber until said expansion-chamber is about half-full. Then when the gas-burner J is ignited the same amount of water contained in the small pipes G, forming the coil G', will be quickly heated and the hot water will flow upward and the cooler water will flow downward, thus establishing a circulation until all of the water is heated to or above the boiling-point, and when the water begins to boil this can be ascertained by watch-

ing the sight-tube L', and the gas will then be regulated so that the water is kept to a point just below boiling, and thus a steady uniform heat is maintained from that time on.

5 Of course I do not wish to be limited to the exact construction here shown, as slight modifications could be made without departing from the spirit of my invention.

Having thus fully described my invention,  
10 what I claim as new and useful is—

In a radiator, a series of horizontal pipes, couplings to which the ends of the pipes are attached, said couplings fitting one above the other, extension-pipes secured to the couplings  
15 in line with the upper and lower pipes of the

radiator, caps threaded on the extensions and having threaded apertures, circulation-pipes threaded in the caps, an expansion-chamber on the upper end of the series of couplings with which the extensions communicate, and 20 binding-bolts extending from the expansion-chamber to the lower end of the couplings, substantially as described.

In testimony whereof I have hereunto affixed my signature in the presence of two sub- 25 scribing witnesses.

FRANK G. FREESE.

Witnesses:

H. B. HALLOCK,

L. W. MORRISON.