

L. F. MERGOTT.
WATER HEATER.
APPLICATION FILED NOV. 28, 1910.

Patented Oct. 13, 1914.

1,113,232.

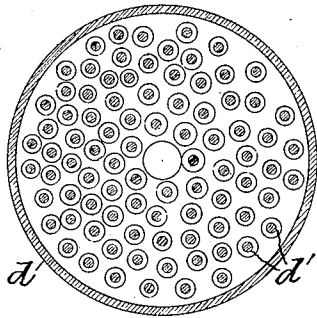


Fig. 2.

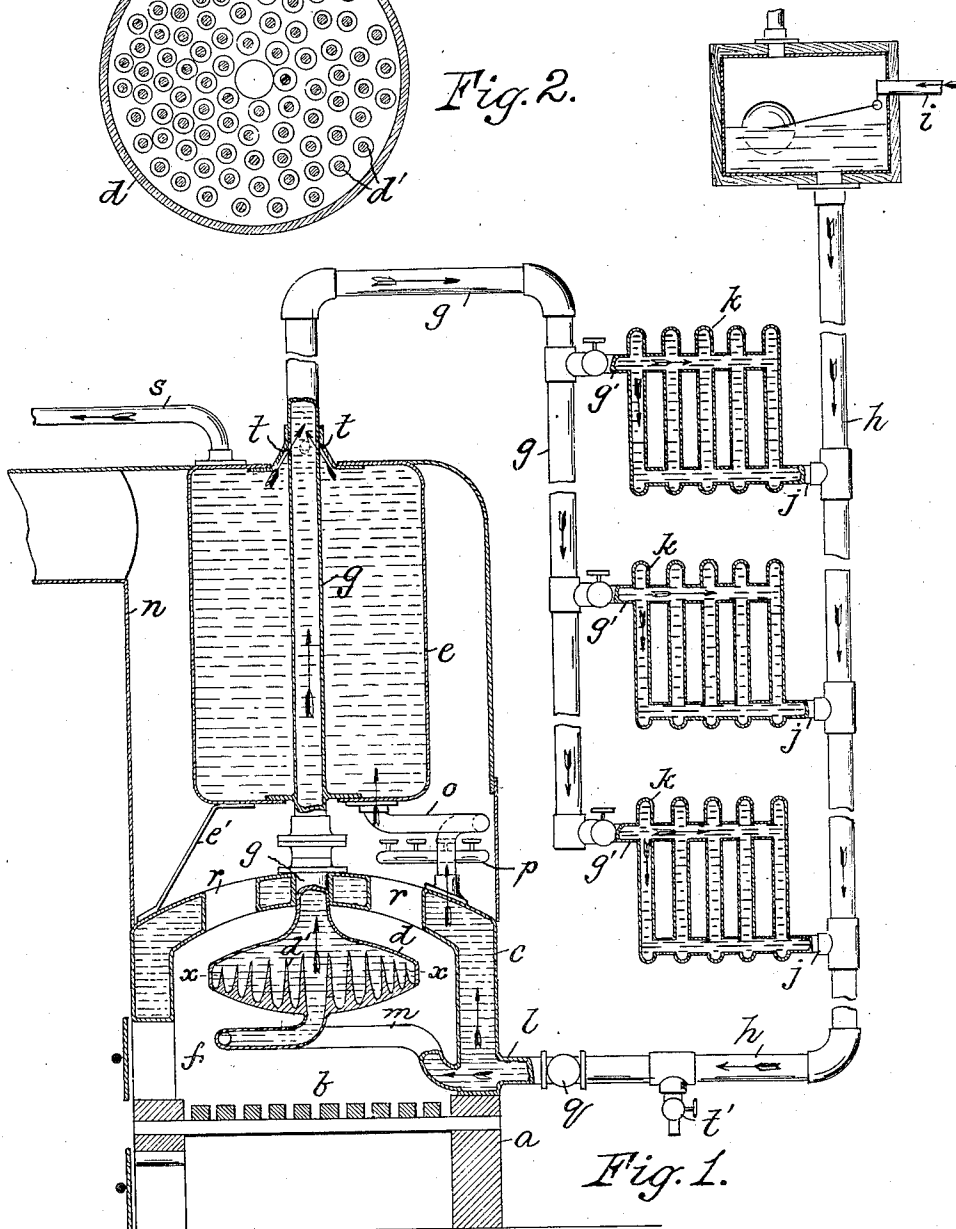


Fig. 1.

WITNESSES:

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WATER-HEATER.

1,113,232.

Specification of Letters Patent.

Patented Oct. 13, 1914.

Application filed November 28, 1910. Serial No. 594,435.

To all whom it may concern:

Be it known that I, LUDWIG F. MERGOTT, a citizen of the United States, residing in the city of Newark, in the county of Essex and State of New Jersey, have invented certain new and useful Improvements in Steam and Hot-Water Heating Systems, of which the following is a full, clear, and exact description, such as will enable others skilled in the art to which it pertains to make, construct, and use the same, reference being had to the accompanying drawings, and to letters of reference marked thereon, forming a part of this specification.

My invention relates to an improvement in steam and hot water heating systems, in which a retort of peculiar construction and arrangement is employed, in combination with a boiler or furnace of ordinary construction, and the object of my invention is to provide a device of this nature which shall be simple, inexpensive, and durable in construction.

Reference is to be had to the accompanying drawings forming a part of this specification, in which similar characters of reference indicate corresponding parts throughout the specification and drawings.

Figure 1 is a diagrammatic view of a heating plant, showing the principle of my invention. Fig. 2 is an enlarged sectional plan view of the retort taken on lines $x-x$ in Fig. 1.

In the said drawings, a represents a steam boiler of ordinary construction, heated by the furnace b , and provided with a water chamber c . Conveniently and centrally suspended in said furnace b above the fire pot f , and circumferentially free from the furnace, is a retort d , from which rises a main rising pipe g , preferably made of copper having branch supply pipes g' leading from the pipe g to the different radiating devices k . i represents an automatic source of water supply, to which one end of a main water supply pipe h is connected, the other end of which is connected to the water chamber c of the steam boiler a at l , the portion of the supply pipe h below the pipe j , for the highest radiator k , acts as a return pipe,

branch supply and return pipes j leading from the main supply and return pipe h to the different radiating devices k . Extending downwardly from the retort d is a coiled pipe m of any convenient form which is connected with and has direct communication with the water chamber c , thus completing the circuit.

The retort as shown, is preferably made of bronze and circular in cross-section, as illustrated in Fig. 2 of the drawings, and is provided on its lower inner surface with a plurality of upwardly tapered heat radiating elements d' . The construction of the retort d and its location inside of the furnace b , it being circumferentially free from the furnace, and its connection with the water chamber c by means of the coiled pipe m , causes the water contained therein, due to the heat of the furnace, to come to a quick boil, thereby causing constant and rapid pulsations or explosions to take place, which produce a strong circulation through the entire system. These pulsations or explosions cause the water to circulate and to operate the check valve q in the water supply pipes h to constantly keep up the proper circulation.

Surrounding the main rising pipe g is a boiler e , which is mounted upon suitable supports e' , secured to the top of the boiler a , and entirely inclosed within and surrounded by a metallic hot air jacket n , which is secured to the upper portion of the boiler a in any convenient manner.

A coiled water supply pipe o is conveniently interposed between and connected with the lower portion of the boiler e , and the top of the water chamber c , by means of which water is caused to flow from the water chamber c into the boiler e . Any convenient means such as for instance, a gas heater p may be located below the coiled pipe o , the purpose of which is to heat the water in the boiler e by means of the coiled pipe o , should it be found desirable, in order to increase the temperature of the water in the system or to furnish an independent supply of hot water for household or other uses.

The apparatus works in the following

manner: When the system is full of water, and the furnace *b* is in operation, the water in the water chamber *c* becomes heated, and the small amount of water in the retort *d* is brought to a quick boil, and is consequently forced upward in the direction indicated by the arrow, through the main rising pipe *g*, and into the branch supply pipes *g'*, through the different radiating devices *k* through the branch supply and return pipes *j*, through the main water supply and return pipe *h*, and then through the check valve *q* back into the water chamber *c*. From the water chamber *c*, the water which has now become pre-heated, passes through the coiled pipe *m*, which is centrally connected to the lower portion of the retort *d* and directly located over the fire in the furnace *b*, into the retort *d*, where it is again brought to a quick boil, thereby producing a strong circulation through the whole apparatus. The boiling water in the retort acted upon by the heat in the furnace, causes constant and rapid pulsations or explosions to take place, which produce a strong circulation through the entire system.

r, r represent flues, of any convenient construction, preferably formed in the top of the water chamber *c* and directly communicating with the metallic combustion chamber *n*, in which is located the boiler *e*, designed to cause the hot air while passing from the furnace and before leaving the chamber *n* to freely circulate around the boiler *e*, thereby heating the water contained therein in addition to its being heated from the main rising pipe *g*, which passes through the center thereof. It will be noted that this construction, in addition to supplying hot water to the system, also provides a convenient hot water supply through the supply pipe *s* for household and other uses, without any additional source of heat than that derived from the furnace.

When the water in the boiler *e* becomes heated to a very high temperature, it will then flow into the main rising pipe *g* through a series of holes *t* conveniently arranged in the same near the top of the boiler *e*, thereby making the heating system more effective. A convenient valve *t'* is located in the main supply pipe *h*, designed to drain the system should it so be desired.

Experience has demonstrated that the organization above described, is a practical and efficient one for accomplishing the ends sought by this invention. The construction may, however, be varied in detail by those skilled in such matters, without departing from the invention.

I claim:

1. In an apparatus of the class described, a water chamber, a retort provided on its lower inner surface with a plurality of up-

wardly tapered heat radiating elements located within and circumferentially free from said water chamber, a circulating pipe extending from the top of said retort, a coiled pipe centrally connecting said retort with said water chamber, and a supplemental water chamber surrounding the circulating pipe, said supplemental chamber being located directly above the first named water chamber.

2. In an apparatus of the class described, a water chamber, a retort provided on its lower inner surface with a plurality of upwardly tapered heat radiating elements located within and circumferentially free from said water chamber, a circulating pipe extending from the top of said retort, a coiled pipe centrally connecting said retort with said water chamber, a supplemental water chamber surrounding the circulating pipe, said supplemental chamber being located directly above the first named water chamber, and a combustion chamber mounted upon the water chamber and inclosing the supplemental water chamber and flues formed in the first named water chamber communicating with said combustion chamber.

3. In an apparatus of the class described, a water chamber, a retort provided at its lower inner surface with a plurality of upwardly tapered heat radiating elements located within and circumferentially free from said water chamber, a circulating pipe extending from the top of said retort, a coiled pipe centrally connecting said retort with said water chamber, and a supplemental water chamber surrounding the circulating pipe, said supplemental chamber being located directly above the first named water chamber, the circulating pipe being provided with a plurality of openings near the top of said supplemental water chamber and communicating therewith, and means interposed between the water chamber and supplemental water chamber for heating the water in the supplemental water chamber.

4. In an apparatus of the class described, a water chamber, a retort provided on its lower inner surface with a plurality of upwardly tapered heat radiating elements located within and circumferentially free from said water chamber, a circulating pipe extending from the top of said retort, a coiled pipe centrally connecting said retort with said water chamber, and a supplemental water chamber surrounding the circulating pipe, said supplemental chamber being located directly above the first named water chamber, the circulating pipe being provided with a plurality of openings near the top of said supplemental water chamber and communicating therewith, a com-

bustion chamber mounted upon the water chamber and inclosing the supplemental water chamber, and means located in said combustion chamber and interposed between
5 the water chamber and supplemental water chamber for heating the water in the supplemental water chamber.

This specification signed and witnessed
this 26th day of November, 1910.

LUDWIG F. MERGOTT.

Witnesses:

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