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A. GLASER & W. H. McINTYRE.

HEATING SYSTEM.

APPLICATION FILED SEPT. 20, 1902.

NO MODEL.

Fig. 1.

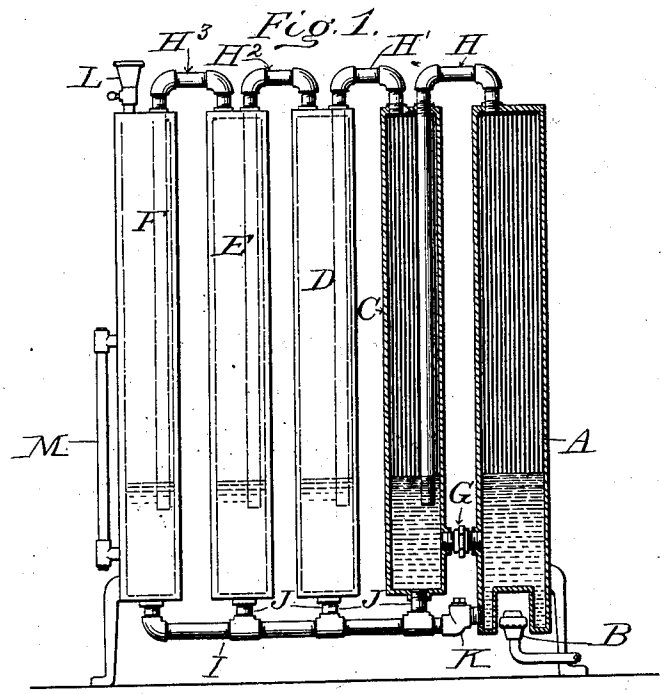
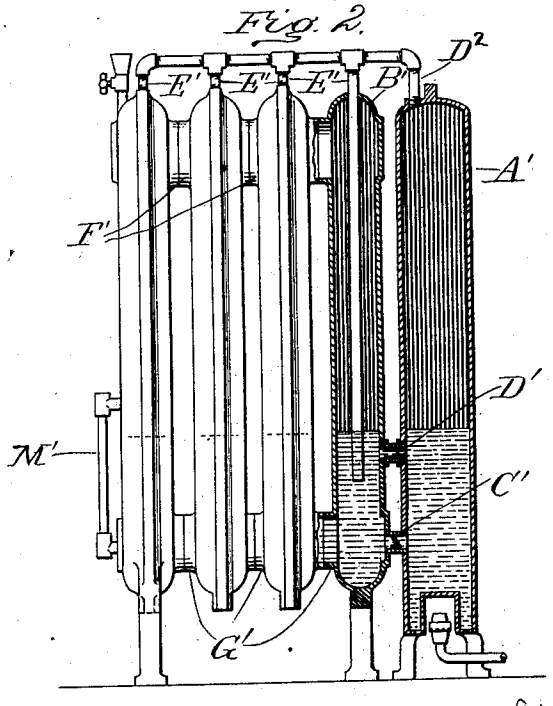


Fig. 2.



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THE NORRIS PETERS CO., PHOTO-LITHO., WASHINGTON, D. C.

UNITED STATES PATENT OFFICE.

ADAM GLASER AND WILLIAM H. McINTYRE, OF JERSEY CITY, NEW JERSEY.

HEATING SYSTEM.

SPECIFICATION forming part of Letters Patent No. 725,554, dated April 14, 1903.

Application filed September 20, 1902. Serial No. 124,219. (No model.)

To all whom it may concern:

Be it known that we, ADAM GLASER and WILLIAM H. MCINTYRE, citizens of the United States, residing at Jersey City, in the county of Hudson and State of New Jersey, have invented certain new and useful Improvements in Heating Systems, of which the following is a specification.

Our present invention relates to heating systems, the construction and advantages of which will be hereinafter set forth, reference being had to the annexed drawings, wherein—

Figure 1 is a side elevation, partly in section, of our system; and Fig. 2, a similar view illustrating the system as applied to any ordinary radiator.

The object of our invention is to construct a heater so that the heat generated in the main or initial chamber will be quickly and evenly distributed throughout the entire heater, so that the whole heater will become heated shortly after the burner is started, thereby utilizing the entire surface of the heater for the purpose of radiation. This object is accomplished by employing a series of chambers, drums, or compartments and so connecting the same that the vapor or steam generated in one will be successively drawn into the others throughout the series, while at the same time the water contained therein will be drawn toward the initial or primary heating-chamber. From this it will be seen that the heat imparted to the water in the primary chamber is distributed to the other chambers in the form of steam or vapor, which not only heats the walls of the chambers, but also the water contained in the lower portion thereof, the water, as just stated, likewise flowing by pulsating action toward the primary chamber and being heated therein by the burner.

The apparatus from actual use has been found to be highly efficient and economical.

In Fig. 1 the apparatus is shown in the form of a portable heater, and comprises a primary heating chamber or drum A, beneath which is placed a burner B of any suitable form, but by preference being designed to burn gas or any hydrocarbon fuel. Four other chambers, drums, or sections C, D, E, and F are employed, though the number may be varied as desired. Chamber C is connected to chamber A near the lower end by a pipe G, while a pipe H extends from the upper part of chamber A and passes through the upper portion of chamber C and down therein to a point below the normal water-level. Similar pipes H′, H^2, and H^3 connect each of the drums with the next drum in turn. A main or pipe I extends below the entire series and is connected with the lower end of each chamber by a suitable branch or lateral J. In the main I at a point between the primary chamber A and the first section C there is placed a check-valve K, which prevents the water from flowing back into the main. A suitable valved filler L is provided, and, if desired, a water-gage glass M may be employed.

The action of the apparatus thus described is as follows: The chambers or drums being filled with water approximately to the level indicated in the drawings, heat is applied to the primary chamber A. The relatively small body of water in chamber A soon becomes heated, as does the water in chamber C, to a certain extent by reason of the cross connection G. Vapor or steam soon rises in chamber A and passing over through pipe H enters the downwardly-extending leg thereof, where it condenses to a certain extent, the condensed water passing down into the water in the lower portion of chamber C. As the pressure becomes greater in the primary chamber the water is apparently forced over into chamber C through the cross connection G and after a period surges back into the primary chamber, uncovering or venting the end of pipe H and permitting the free escape of steam or vapor into said chamber C. Cross connection G may be omitted; but the apparatus is found to start up quicker when it is present. From this it will be seen that the primary chamber and the first adjacent one of the series soon reach the same or substantially the same degree of temperature. Vapor or steam then passes from chamber C into chamber D through pipe H and in turn heats chamber D. The water moves from this chamber with a pulsating action through pipe I and check-valve K to the primary chamber. The same action takes place throughout the entire series, and, as before noted, the vapor soon travels from the primary drum or cham-

ber to the other drums or chambers of the series. That a pulsating action does take place in the apparatus has been demonstrated by placing a petcock near the lower end of the last section, water being forced from and air being drawn in therethrough alternately.

In Fig. 2 the system is shown as applied to an ordinary hot-water radiator. The primary chamber A′ is connected to the first loop or section B′ by a lower pipe C′ and a second circulating-pipe D′, while extending from the upper end of the chamber is a pipe D^2, to which is connected a series of pipes E′, one for each section or loop of the radiator. Said pipes E′ extend down into the loops to a point below the normal water-level, as shown. As is usual, the loops are in direct communication with each other at the top and bottom through passages F′ and G′. The action of the apparatus thus described is essentially the same as that above given, the steam or vapor passing from the primary chamber to the others and the water always flowing toward the primary heater. With this construction, however, the loops or coils may heat up more nearly at the same time, owing to the direct connection of the vapor or steam pipe to each of the loops.

The construction shown is to be taken as merely illustrative, the size, shape, and general proportions being widely variable without departing from the spirit of our invention.

While the action above described is thought to be that which takes place within the apparatus, it is of course difficult to clearly ascertain or figure out what actually transpires in an apparatus of this nature, and we therefore do not desire to be understood as limiting ourselves by such explanation. Practically the apparatus is successful, no matter what may be its theoretical or actual operation.

In the accompanying drawings we have not sought to show the parts drawn to a scale, and the drawings should be read with this understanding.

With an apparatus constructed on the lines of Fig. 1 a simple and portable device is produced, one which may readily be carried from room to room, the burner being supplied with ordinary illuminating-gas or with any suitable and efficient hydrocarbon.

Having thus described our invention, what we claim is—

1. In a heater or heating system, the combination of a primary heater; a series of drums or chambers; connections extending from the upper portion of the primary heater to a point near the bottom within the first chamber of the series; similar connections, extending from each of said drums or chambers of the series to the next succeeding drum or chamber; and a return leading to the lower portion of the primary heater from the lower portion of each of the drums in the series.

2. In a heater or heating system, the combination of a primary heating-chamber; a series of drums or chambers; means for conveying steam or vapor from the upper portion of the primary chamber to each of said drums or chambers, and discharging the same below the normal water-level therein; and a water connection between the lower portion of the primary chamber and the lower portion of each chamber of the series to normally maintain a body of water in the lower part of each of said chambers.

3. In a heater or heating system, the combination of a primary heating-chamber; a series of drums or chambers; means for conveying or permitting the passage of steam or vapor from the upper portion of the primary chamber to each of said chambers and discharging the same below the normal water-level therein; a water connection between the lower portion of the primary chamber and the lower portion of each chamber of the series; and a second water connection between the primary chamber and the first chamber of the series, substantially as and for the purpose described.

4. In a heater or heating system, the combination of a primary heating-chamber; a series of drums or chambers; means for conveying or permitting the passage of steam or vapor from the upper portion of the primary chamber to each of said chambers and discharging the same below the normal water-level therein; a water connection between the lower portion of the primary chamber and the lower portion of each chamber of the series; a check-valve located in said water connection adjacent to the primary chamber; and a second water connection between the first chamber of the series, substantially as and for the purpose described.

In testimony whereof we have signed our names to this specification in the presence of two subscribing witnesses.

ADAM GLASER.
WILLIAM H. McINTYRE.

Witnesses:
SAMUEL ALBRECHT,
VALENTINE TOPP.