June 6, 1939. F. T. HOLMES 2,161,417

WATER HEATER

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Fig. 1.

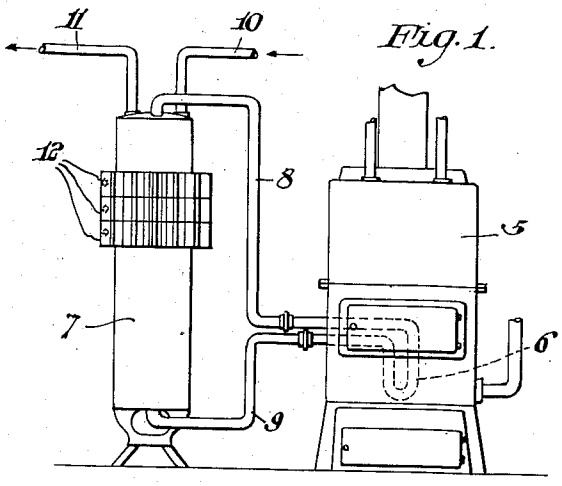
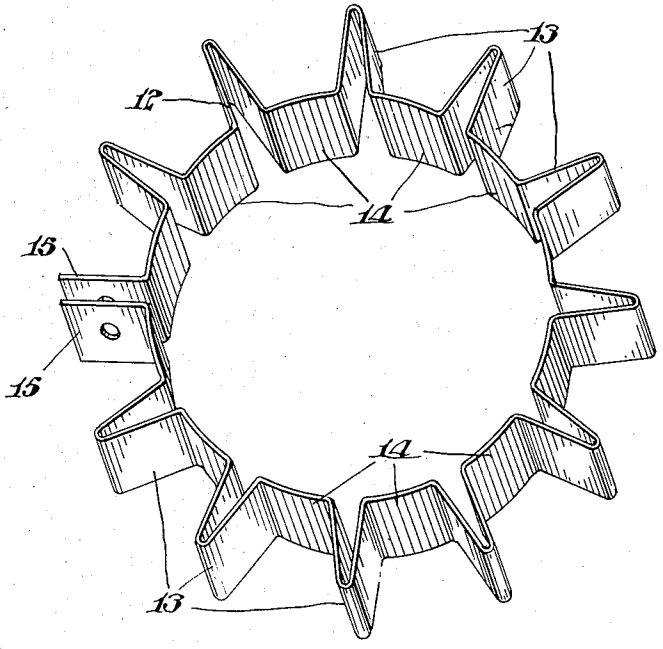



Fig. 2.




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## WATER HEATER

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3 Claims. (Cl. 122—13)

This invention relates more particularly to that type of water heater used in dwellings and other buildings, in which the water is primarily heated by means of a water back, often termed a "coil", positioned within the fire box of the building heating furnace, and having associated therewith a storage tank or reservoir which is connected by suitable piping to the water back, whereby the water, which is heated within the water back, is circulated through the said piping from and to the storage tank.

In the use of water heaters of the aforesaid type, an annoying and sometimes destructive knock or hammer occurs in the system, particularly when the fire in the heating furnace is very hot.

The principal object of the present invention is to provide a simple and efficient means for preventing such knocks or hammers, which means may be readily applied to existing water heaters as occasion may require, and without requiring any particular skill on the part of the person applying the same.

The objectionable knock or hammer, in water heaters of the aforesaid type, is apparently caused by the generation of steam within the water back when the fire in the furnace is hotter than is ordinarily required to maintain a sufficient supply of hot water. An object of the present invention, therefore, is to eliminate this objectionable knock or hammer by reducing the temperature of the water in the tank so that the water flowing back from the bottom of the storage tank to the water back is not subject to the tendency to vaporize too quickly.

With the foregoing in view, the present invention contemplates the provision of heat dissipators mounted exteriorly of the heating furnace and preferably on the shell of the storage tank, which heat dissipators are made in a plurality of units or sections, so that a larger or smaller number thereof may be applied when a knock or hammer occurs in the system, the requisite number required in each instance being readily determinable by trial.

The nature and characteristic features of the present invention will be more readily understood from the following description taken in connection with the accompanying drawing forming part hereof, in which:

Figure 1 is an elevational view, to a certain extent diagrammatic, illustrating a water heater embodying the main features of the present invention; and

Fig. 2 is a perspective view of one element of a heat dissipator detached, the same being shown in a preferred form thereof.

It will, of course, be understood that the description and drawing herein are illustrative merely and that various changes and modifications may be made in the structure disclosed without departing from the spirit of the invention.

Referring now more particularly to Fig. 1 of the drawing, 5 is the heater of a household heating plant which may be of the hot water, steam, or hot air type, or it may even be a kitchen range. Disposed within the fire chamber of the heater 5 is the water back or "coil" 6 which may take any of the forms of such devices as are well known and in common use. Arranged in proximity to the heater 5 is the hot water storage tank 7 connected by circulation pipes 8 and 9 to the water back 6.

The pipe 8 extends from the top of the storage tank 7, whereas the pipe 9 extends from the bottom of the storage tank 7, the arrangement being such that, when there is a fire within the heater 5, the thermal head of the water in the pipes 8 and 9 will cause a circulation from the bottom of the storage tank to the water back through pipe 9, and from the water back through the pipe 8 to the top of the tank. In this manner the water within the storage tank will be kept heated for use when required. Water is supplied to the tank by means of the pipe 10, and is drawn off therefrom through pipe 11 which extends to the plumbing fixtures of the building.

It is, of course, understood that the fire within the heater 5 will vary in its intensity from time to time. It is, therefore, necessary to provide a water back of sufficient size to maintain the desired temperature of the water within the storage tank when the fire within the heater 5 is comparatively low.

With the foregoing in mind, it will be apparent that when the fire within the heater 5 is kept quite hot over a period of time, the water in the storage tank will become heated to a temperature close to the boiling point, and when the same returns through the pipe 9 from the reservoir to the water back, it will be more or less periodically flashed into steam, causing the objectionable knock or hammer.

To obviate this objectionable knock or hammer, the present invention contemplates the provision, preferably in connection with the water storage tank, of heat dissipators, which may be of any preferred form and of such heat transferring capacity as to dissipate sufficient heat to prevent the water within the tank from reaching a tem-

perature close to the boiling point, and thus eliminate the generation of the steam within the water back.

The heat dissipators are preferably made in separate units or sections, so that a greater or lesser number thereof may be applied to the shell of the storage tank as may be required.

In Fig. 2 there is shown a preferred form of heat dissipator 12 which may be inexpensively made from a strip of sheet material, preferably of copper or the like, and which is so shaped and formed as to provide a plurality of V-shaped projecting fins 13, the legs of which are connected by sector portions 14 of the strip. At the ends of the strip, wings 15 may be provided for fastening the ends to each other when the unit is mounted on the shell of the storage tank.

When a heat dissipator of the form above described is mounted on the shell of the water storage tank, the surrounding air will freely circulate through the triangular spaces defined by the V-shaped fins 13, so that the internal surfaces as well as the external surfaces of said fins will serve in the dissipation of the heat.

In the use of the heat dissipators, whenever a water heater of the type hereinbefore disclosed develops an objectionable knock or hammer for the reasons aforesaid, the heat dissipator units may be successively applied to the shell of the tank until a sufficient number is applied to eliminate the knock or hammer.

It will be found that the use of the heat dissipators will not ordinarily involve any appreciable loss of efficiency of the hot water heater, as the amount of heat dissipated will be approximately proportional to the temperature of the water within the storage tank, and that if the number of the said heat dissipators employed is sufficient only to eliminate the knock or hammer, no great amount of heat will be lost when the system is functioning with the water at the ordinary desired temperatures.

I claim:

1. The combination with a domestic water heater or the like which would otherwise have a tendency to knock or hammer when the water therein becomes overheated, said water heater comprising a water back, a heater in which the same is positioned, a hot water storage tank, and circulation pipes connecting the water back and storage tank, of means for preventing such knock or hammer which comprises a heat dissipator mounted directly on the shell of the storage tank and having portions extending outwardly therefrom to provide heat dissipating surfaces.

2. The combination with a domestic water heater or the like which would otherwise have a tendency to knock or hammer when the water therein becomes overheated, said water heater comprising a water back, a heater in which the same is positioned, a hot water storage tank, and circulation pipes connecting the water back and storage tank, of means for preventing such knock or hammer which comprises a heat dissipator mounted on the storage tank adapted to prevent the water in the storage tank from reaching an excessive temperature, said heat dissipator comprising a device having portions bearing against the shell of the storage tank and portions extending outwardly therefrom to provide heat dissipating surfaces.

3. The combination with a domestic water heater or the like which would otherwise have a tendency to knock or hammer when the water therein becomes overheated, said water heater comprising a water back, a heater in which the same is positioned, a hot water storage tank, and circulation pipes connecting the water back and storage tank, of means for preventing such knock or hammer which comprises a heat dissipator mounted on the storage tank adapted to prevent the water in the storage tank from reaching an excessive temperature, said heat dissipator comprising a plurality of separately mounted units, each of said units having portions bearing against the shell of the storage tank and portions extending outwardly therefrom to provide heat dissipating surfaces.

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