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W. BRÜCKNER.

HOT WATER HEATING SYSTEM.

APPLICATION FILED MAR. 31, 1903.

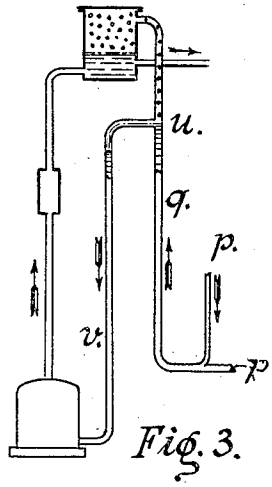


Fig. 3.

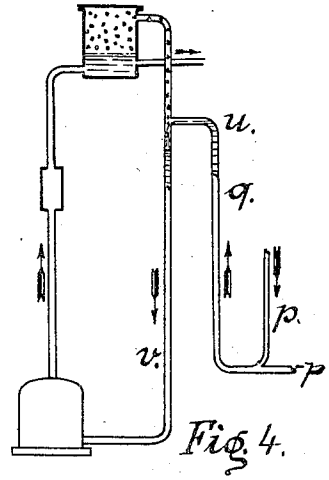


Fig. 4.

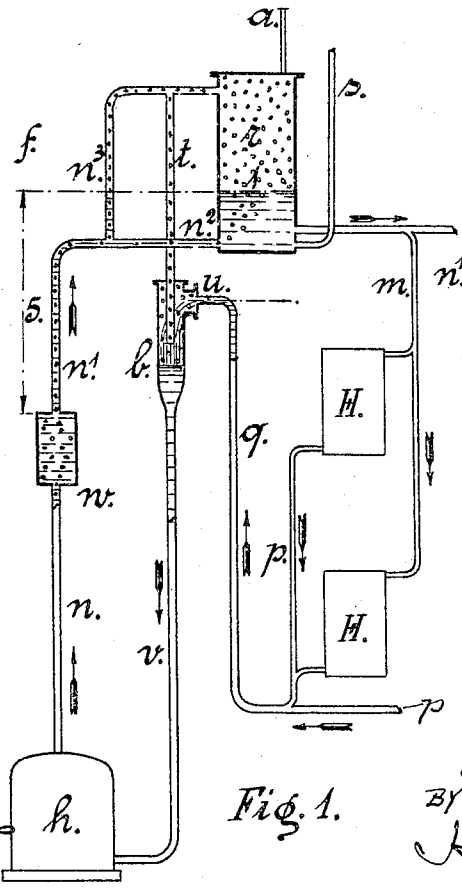


Fig. 1.

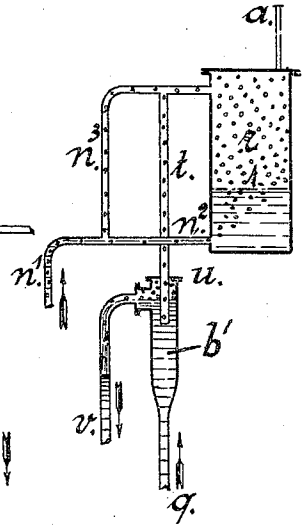


Fig 2.

WITNESSES:

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No. 792,494. Patented June 13, 1905.

UNITED STATES PATENT OFFICE.

WILHELM BRÜCKNER, OF VIENNA, AUSTRIA-HUNGARY.

HOT-WATER HEATING SYSTEM.

SPECIFICATION forming part of Letters Patent No. 792,494, dated June 13, 1905.

Application filed March 31, 1903. Serial No. 150,424.

To all whom it may concern:

Be it known that I, WILHELM BRÜCKNER, a subject of the Emperor of Austria-Hungary, residing at Vienna, Empire of Austria-Hungary, have invented certain new and useful Improvements in Hot-Water Heating Systems; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

The object of this invention is to provide an improved hot-water heating apparatus, which will permit the heating of the water above 100° Celsius and improve the speed of circulation, thereby permitting the use of small tubing.

The improved system of this invention is provided with means for stimulating the circulation by forming steam-bubbles in the ascending pipe, which leads to the cistern or expansion-chamber. Accumulation of steam in the cistern would tend to prevent such formation of bubbles in the ascending pipe. For that reason the accumulated steam in the cistern is allowed to return to the water after the latter has been passed through the heating unit to be condensed by said water without loss of water and heat which would occur if the steam were allowed to escape to the atmosphere.

In the accompanying drawings, Figure 1 is a diagrammatic view of my improved arrangement of apparatus. Fig. 2 is a view of a modified detail of part of Fig. 1. Figs. 3 and 4 are diagrammatic views showing detail modified arrangements for connecting the return-pipe.

As shown in Fig. 1, h is the boiler from which an outgoing tube $n\ n'$ leads to a cistern r, which it joins at n^2. A branch pipe n^3 may lead from the pipe n' to the top of the cistern r. In the pipe $n\ n'$ I form an enlargement or chamber w. The cistern r near its bottom is supplied with a pipe m, leading to heating-bodies H H and from thence by pipes p to an ascending return-pipe q, which is located near but beneath the bottom of the cistern r. This pipe q is shown in Fig. 1 as entering a receptacle b near its upper end u, said receptacle terminating at its lower end in a descending return-pipe v, leading to the bottom of the boiler h, while a tube t leads from the receptacle b to the upper part of the cistern r. In Fig. 2 a similar arrangement will be observed except that in this modification it is the pipe q which terminates in the receptacle b', the descending return-pipe v opening out of the upper part u of the receptacle. In Figs. 3 and 4 I have shown the receptacle as dispensed with. In Fig. 3 the ascending return-pipe q merges directly into a horizontal arm of the descending return-pipe v, while the pipe t meets them at their intersection. In Fig. 4 the construction is similar, but the pipe q is provided with the horizontal arm. In all the modifications the action is substantially the same.

The cistern r, as shown in Fig. 1, may be provided with a safety-tube a and an expansion-pipe s, as shown.

In operation suppose the water in the boiler to be heated to 100° Celsius steam and water will both be passed out of the boiler h through the pipe n to the enlargement w, where the steam will be formed more freely and advance through the pipe n' in bubbles along with the water, greatly lowering the specific gravity of the mixture between the dotted lines coupled by the reference 5, as shown on the drawings. The steam will separate entirely out of the water in the cistern r and rise therein, where it may travel through the pipe v to add its heat to the cooled water in the descending return-pipe v and itself be condensed thereby. The water in the cistern r, released of the steam, will flow into the pipe m, heaters H, and pipes p to the ascending return-pipe q, overflow into the descending return-pipe v, and thus travel back to the boiler h.

The cause of circulation may be attributed to the difference in specific gravity between a hot-steam-carrying column in pipe $n\ n'$ and a cooler column returning through the heating-bodies h, while the depending pipe t saves the condensation-water, which might otherwise be lost, by returning it to the descending return-column v.

I claim as my invention—

1. In a hot-water heating system, the com-

bination of a boiler, a cistern located at a higher level than the boiler, an outgoing tube ascending from the boiler to the cistern provided with an enlargement at a level intermediate between the cistern and the boiler, heating-bodies, tube connection of such heating-bodies with the bottom part of the said cistern, an ascending return-tube having its top end at a level below the cistern, tube connection of such heating-bodies with the bottom end of the ascending return-tube, a descending return-tube connecting the top end of the ascending return-tube with the boiler and a tube connecting the top portion of the cistern with the top end of the ascending return-pipe.

2. In a hot-water heating system, the combination of a boiler, a cistern located at a higher level than the boiler, an outgoing tube ascending from the boiler to the bottom part of the cistern, a pipe connecting the top part of such tube located outside the cistern provided with an enlargement at a level intermediate between the cistern and the boiler, heating-bodies, tube connection of such heating-bodies with the bottom part of the said cistern, an ascending return-tube having its top end at a level below the cistern, tube connection of such heating-bodies with the bottom end of the ascending return-tube, a descending return-tube connecting the top end of the ascending return-tube with the boiler, and a tube connecting the top portion of the cistern with the top end of the ascending return-pipe.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

WILHELM BRÜCKNER.

Witnesses:

ALVESTO S. HOGUE,

O. SWOBODA.