

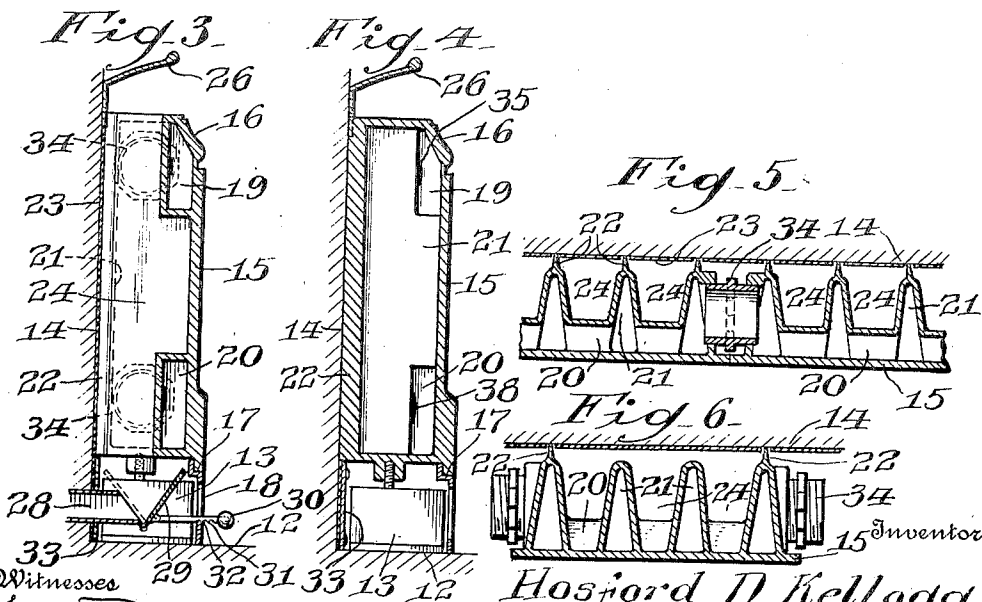
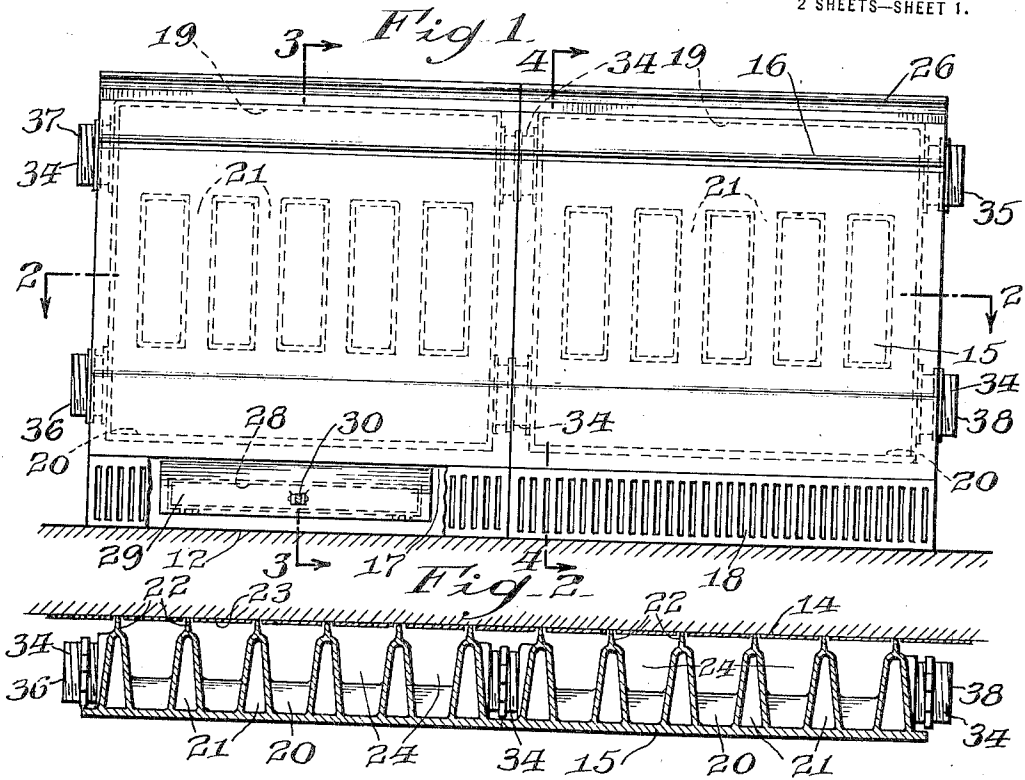
H. D. KELLOGG,  
RADIATOR.

APPLICATION FILED MAY 5, 1916. RENEWED SEPT. 15, 1919.

1,341,649.

Patented June 1, 1920.

2 SHEETS—SHEET 1.



Witnesses  
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 Jane V. Sweeney

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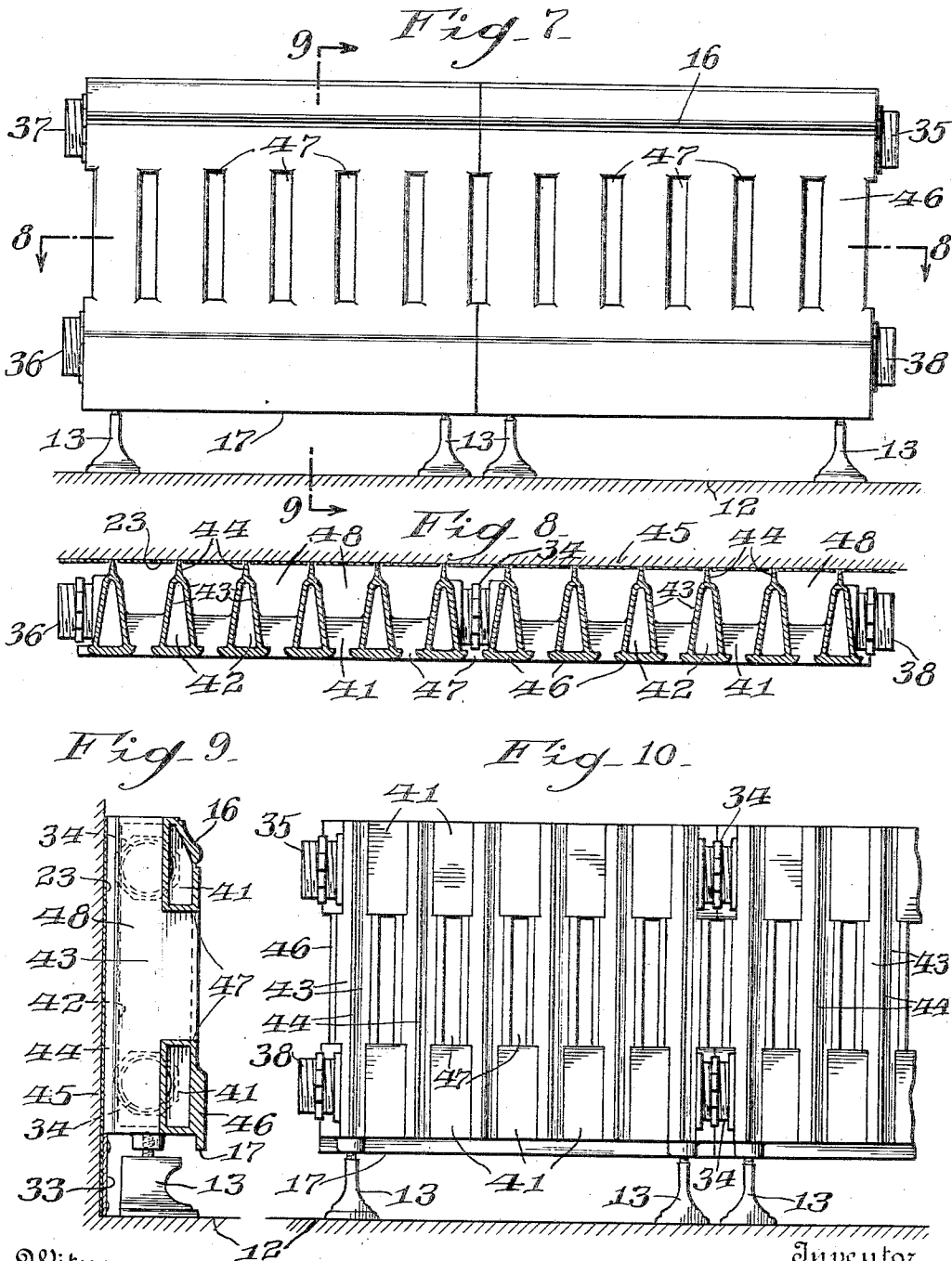
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# UNITED STATES PATENT OFFICE.

HOSFORD D. KELLOGG, OF HAVERFORD, PENNSYLVANIA.

## RADIATOR.

1,341,649.

Specification of Letters Patent.

Patented June 1, 1920.

Application filed May 5, 1916, Serial No. 95,531. Renewed September 15, 1919. Serial No. 323,995.

*To all whom it may concern:*

Be it known that I, HOSFORD D. KELLOGG, a citizen of the United States, and a resident of Haverford, county of Delaware, and State of Pennsylvania, have invented certain new and useful Improvements in Radiators, of which the following is a full, clear, and exact disclosure.

The object of the invention is to provide a novel form of radiator for raising the temperature of the atmosphere of a room or chamber by passing through the former a heated fluid, such for instance as steam, vapor, hot water, or the like, and to accomplish the same with the greater degree of efficiency and minimum loss of effective heat, or to provide a refrigerator of the same general design.

Another object is to provide a radiator which can be installed within a room in the position and occupying the place of the usual sub-base or other architectural finish of a room and at the same time be little or no more conspicuous.

And another object is to provide a radiator in which the fluid therein can flow from end to end through two or more longitudinal channels, and through transverse channels connecting the former, the outer or front side of all of said channels lying in a plane.

A further object is to provide such a radiator with a plurality of continuous, or substantially continuous, portions comprising the walls of upwardly extending fluid channels, or integral projections thereof, the same being adapted to contact directly with the wall of a room, or a lining thereof, and thus provide flues for heating and circulating air as hereinafter described.

A still further object is to provide a radiator of any desired height and length and longitudinally made up of any desired number of rearwardly directed substantially V-shaped upwardly extending sections, each pair of neighboring sections forming with an adjacent wall surface flues which are substantially vertical, but in general are sufficiently upright to permit the air in passing around said radiator to develop the desired velocity and volume in circulating upwardly as it becomes heated.

And still another object of the invention is to provide a radiator comprising a plurality of substantially horizontally extending spaced channels and a plurality of substantially vertically extending channels connect-

ing, and of greater extent from front to rear, than said first channels, and provided with ridges extending longitudinally of and forming integral projections from the outer surfaces of said latter channels and adapted to cooperate throughout their entire extent with the wall of a room, to form individual air flues, each of which is preferably wholly inclosed by the walls of two adjacent vertical channels and the said wall.

And another object is to provide a radiator of this description having vertical channels, tapering in cross section rearwardly, and connected adjacent to their upper and lower extremities by short sections of the longitudinally extending main channels and intermediate thereof by webs extending therebetween, this making a construction which insures a maximum amount of the radiant heat from the walls of said channels acting upon and being absorbed by that portion of a wall inclosing the otherwise open side of said flues and normally possessing a lower temperature than the walls of the radiator flues.

With such a construction the walls of the radiator flues transmit to the neighboring atmosphere a maximum amount of their heat by direct contact therewith, by convection therefrom, and by the radiant heat rays acting directly upon and raising the temperature of the wall surface opposite thereto, and in this way also raising the temperature of the air circulating upwardly adjacent to said wall, though quite removed from the actual surface of the radiator. The same effect is produced upon any lining to said wall surface.

Numerous other objects and advantages of the device as well as the various details of the construction thereof are fully described in the following specification when read in conjunction with the accompanying drawings, in which—Figure 1 is a front elevation of the preferred embodiment of the invention; Fig. 2 is a horizontal section on the line 2—2 of Fig. 1; Fig. 3 is a transverse section on the line 3—3 of Fig. 1; Fig. 4 is a similar section on the line 4—4 of Fig. 1; Fig. 5 is a section similar to Fig. 2, but taken horizontally through the upper coupling between two adjacent radiator sections; Fig. 6 is a similar section to that shown in Fig. 5, but showing a slight modification of the wall contacting means; Fig. 7 is a modified form of the device showing

openings through the webs connecting the various fluid channels; Fig. 8 is horizontal section on the line 8—8 of Fig. 7; Fig. 9 is a vertical section on the line 9—9 of Fig. 7; and Fig. 10 is a rear elevation of the form of the invention shown in Fig. 7.

Referring to Figs. 1 to 6, inclusive, of the drawings, the invention in its preferred embodiment relates to a radiator construction preferably adapted to rest either directly upon a floor 12, or to be spaced therefrom upon supporting feet 13, while the rear of the device contacts directly with the wall 14 of a room or chamber, the height of the radiator in this instance being substantially the same as that of a sur-base or mop-board and of relatively slight increase in depth thereover from front to rear.

The radiator proper primarily consists of a cast or sheet metal casing comprising a front wall 15, which may be of any suitable design, as at the portion 16, for the purpose of harmonizing with the woodwork or other decorations of the room, while the lowermost portion of said wall is open at 17 or designedly closed by a suitable grating or grill 18. Immediately to the rear of the wall 15 and adjacent to the upper and lowermost portions thereof are longitudinally extending channels 19 and 20 of relatively shallow transverse extent, while connecting the same are a series of vertically extending channels 21, which, however, are preferably tapering in cross section rearwardly, as shown in Figs. 2, 5 and 6, and of considerably greater transverse extent from front to rear than the corresponding measurement of said first-named channels.

Formed on the rearmost portions of the walls of the vertically extending channels 21 are integral ridges or flanges 22, which are adapted to contact with the wall 14 throughout their entire extent, or when desired, with a relatively thin sheet or lining 23 of heat insulating or other material. With this construction it is obvious that there is formed a series of substantially vertically extending flues 24, each being bounded by the walls of two of the vertical channels 21, a relatively short section of the wall 15 of the radiator and the wall 14 of the room, it also being noted that the adjacent walls of each pair of neighboring vertical channels diverge rearwardly, this construction being preferable in view of the fact that it increases the effect of radiating surface in heating the air circulating within said flues by the radiant heat energy recovered from the inclosing walls thereof.

In the simplest form of the device, the relatively cool atmosphere of the room enters through a grating 18 or, in other words, beneath the wall 15 of the radiator and passes upwardly through the respective flues above described, where said air is raised in tem-

perature by direct contact with the outer surfaces of the walls of both the horizontally and vertically extending channels, by convection of the heat therefrom and absorption by said air, and by the radiant heat from said walls passing across the space intervening between them and the wall of the room opposite thereto, which latter is raised in temperature and in turn gives off heat to that portion of the air passing adjacent thereto in its upward course of circulation toward the uppermost extremity of the device, whence it is emitted into the open area of the room after preferably being deflected outwardly by a suitable flange or deflector 26.

In various installations it will be found desirable to provide ventilation while raising the temperature of the atmosphere of a room by heating fresh-air conveyed by flues within the adjacent wall opening directly beneath the improved radiator, as for instance the inlet 28, shown in Fig. 3, and closed and opened at will by the pivotally mounted damper 29 manually operated by a suitable handle 30 and operative to maintain any desired position at which it may be set by the cooperation of a series of rack teeth 31 with any suitable stop 32, which latter may comprise a portion of the grating 18. If desired a sheet metal or other shield 33 may be made to cover that portion of the wall 14 beneath the radiator and thus protect the same when cleaning or washing beneath the latter. Also, instead of providing the walls of each of the vertically extending channels with flanges as hereinbefore described, a construction may be provided similar to that shown in Fig. 6, wherein only the end channels of each radiator section, projecting as shown are so equipped, substantially the only difference however being that, instead of the air entering the space between two adjacent channels and remaining therebetween throughout its entire passage upwardly, it is more free to pass from one of such partially inclosed flues into another, though the efficiency in heating the atmosphere is somewhat less with this construction.

As before stated, the improved radiator may be formed in relatively small sections, any number of which may be joined together, as shown in Fig. 1, by suitable nipples 34 connecting both of the longitudinally extending channels 19 and 20. After a desired number of these sections have been so connected, any one of the four openings at the opposite ends of the series of sections may be employed as the inlet for the heated fluid, as for instance at 35, where a control valve (not shown) is placed to vary at will the amount or rate of passage of the heating fluid therefrom. Any one of the remaining lower openings may then be used as an exit

or return outlet, though it is preferable to use that designated by 36, and to which the usual L and other pipe fittings are connected, plugs then being employed to close the remaining openings 37 and 38.

Referring now to Figs. 7 to 10, inclusive, of the drawings, a slightly modified form of the invention is shown in which the arrangement of the horizontal and vertical channels 41 and 42 are the same as hereinbefore described, while the walls 43 of each of the latter taper rearwardly and are extended to form integral flanges 44, adapted to cooperate directly with the wall 45 of a room; or with a thin lining thereof. The front wall 46, however, is provided with vertically extending slots 47, partially designed to enhance the general appearance of the device, and also adapted to permit heated air to pass therethrough, from the rear forwardly, particularly in the event of there occurring a congestion of air behind the radiator due to such a cause, for instance, as the partial restriction of the upper openings or exits of the flues 48, formed by pairs of neighboring vertical channels and the said wall 45, either temporarily or by a suitable deflecting flange or dust guard, such as is shown in Figs. 3 and 4.

Although possibly not fully understood at the present time, with the forms of radiator herein described, it has been found that under all conditions an increased heating efficiency is obtained over all other known radiators having a like amount of radiating surface, this being due to the construction of the various series of flues and exposing the entire surface of the radiator to the free action of radiant heat and freest contact of the circulating air thereupon greatly increasing the velocity of the upward air flow; also to the nearness of the radiator as a whole to the floor and thus obtaining a greater lateral or wall distribution of the radiating surface of an equal area, and to the nearness of the said radiator and exposure thereof to and contact with a relatively cool wall surface, to the peculiar construction and shape of the upright air flues either totally or substantially inclosed with the wall of the room acting as one side thereof, and to other details in the general construction, the respective values of which may not at this time be fully realized.

Having thus described my invention, what I claim and desire to protect by Letters Patent of the United States is:—

1. A radiator, comprising a plurality of spaced longitudinally extending channels, a plurality of spaced transversely extending channels provided with integral projecting flanges, and a web connecting the walls of said channels adjacent to one side thereof, said radiator being adapted to be positioned

so that said flanges cooperate with the wall surface of a room, to provide air flues inclosed by said surface, said web and the walls of said transverse channels.

2. A radiator, comprising a plurality of spaced longitudinally extending channels, a plurality of spaced transversely extending channels projecting rearwardly beyond said first channels, and a web provided with restricted openings and extending between the walls of said channels, said radiator being adapted to be positioned against, and with the walls of said transverse channels in uniform contact with, the wall of a room, to form substantially inclosed upright flues surrounded by said web, the said last-named wall and the walls of said channels.

3. A radiator comprising substantially vertical channels having rearwardly converging walls, a web extending between the walls of said channels, said radiator adapted to be positioned adjacent to the wall of a room with the extreme portions of said channel walls cooperating uniformly with the outer surface of said last-named wall or a covering thereon to form inclosed flues of substantially frusto-conical cross section bounded by pairs of said channel walls, said web and the said wall of a room.

4. A radiator, comprising a substantially plane surface, fluid channels extending longitudinally of and adjacent to said surface, and transversely extending substantially vertical channels connecting the former and of greater extent from front to rear, and adapted to cooperate with the wall surface of a room to form a series of flues substantially inclosed by the surfaces of said vertical channels and said wall surface.

5. A radiator unit, comprising a substantially plane face wall, fluid channels extending longitudinally of and adjacent to said wall, and transversely extending substantially vertical channels connecting the former adjacent to said wall and of greater extent therefrom, the rearmost portions of the walls of said latter channels being adapted to cooperate with the wall surface of a room to form therewith one or more flues.

6. A radiator unit, comprising a substantially plane face wall, fluid channels extending longitudinally of and adjacent to said wall, and transversely extending substantially vertical channels connecting the former adjacent to said wall and of greater extent therefrom, the rearmost portions of the walls of said latter channels being adapted to cooperate with the wall surface of a room to form therewith one or more flues, substantially inclosed by adjacent surfaces of said transverse channels, said wall surface, and said planular wall.

7. A radiator comprising a plurality of spaced longitudinally extending channels, a plurality of spaced transversely extending

channels, and a web connecting the walls of  
 said channels adjacent to one side thereof,  
 said radiator being adapted to be positioned  
 so that the walls of said transversely extend-  
 5 ing channels cooperate with the wall sur-  
 face of a room, to provide an air flue in-  
 closed by said wall surface, said web and the  
 walls of said transverse channels.

8. A radiator, comprising a plurality of  
 10 spaced longitudinally extending channels, a  
 plurality of spaced transversely extending  
 channels projecting rearwardly beyond said  
 first channel and a web extending between  
 15 the walls of said channels, said radiator be-  
 ing adapted to be positioned against, and  
 with the walls of said transverse channels  
 in uniform contact with, the wall of a room,  
 to form substantially inclosed upright flues  
 20 surrounded by said web, the last-named wall  
 and the walls of said channels.

9. A radiator comprising substantially  
 vertical channels having rearwardly con-  
 verging walls, a web extending between the  
 walls of said channels on the said radiator

adapted to be positioned adjacent to the wall 25  
 of a room with the extreme portions of said  
 channel walls cooperating uniformly with  
 the outer surface of said last named wall  
 of a covering thereon, to form inclosed flues  
 bounded by pairs of said channel walls, said 30  
 web and the said wall of a room.

10. A radiator, comprising a substantially  
 planular front wall, a longitudinally ex-  
 tending channel adjacent to said wall, and  
 a plurality of spaced transversely extending 35  
 channels intersecting said first channel ad-  
 jacent to said wall, said radiator being  
 adapted to be positioned so that the walls  
 of said transversely extending channels co-  
 operate with the wall surface of a room, to 40  
 provide an air-flue inclosed by said wall  
 surface, said front wall and the walls of  
 said transverse channels.

In witness whereof, I have hereunto set  
 my hand this 4th day of May, A. D., 1916. 45

HOSFORD D. KELLOGG.

Witness:

J. STUART FREEMAN.