Nov. 26, 1929. W. E. KUENSTLER 1,737,251

RADIATOR

Filed Dec. 15, 1927 3 Sheets-Sheet 1

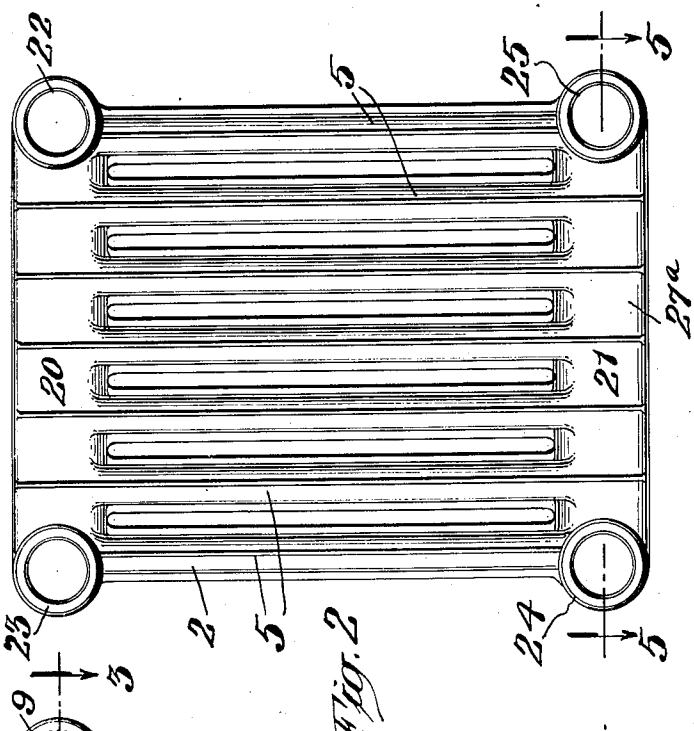


Fig. 2.

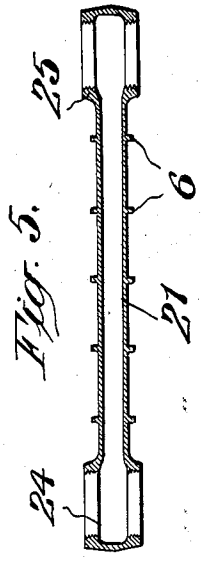


Fig. 5.

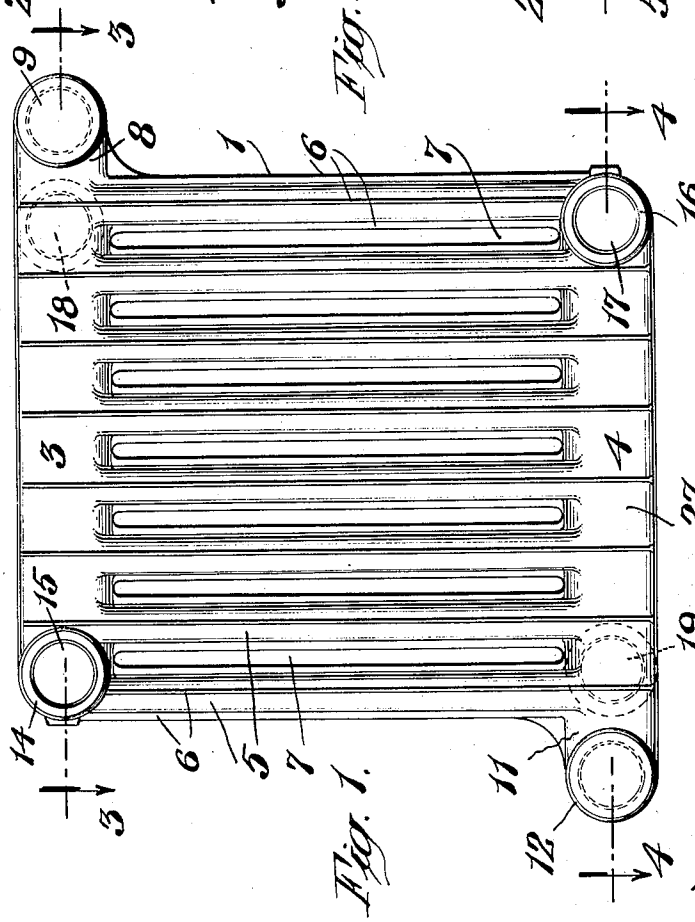


Fig. 1.

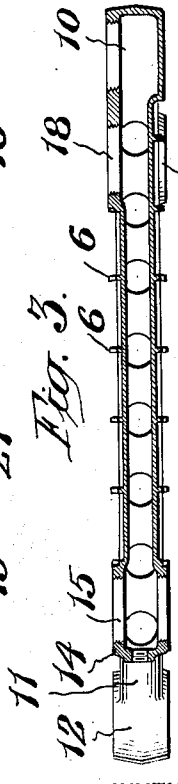


Fig. 3.

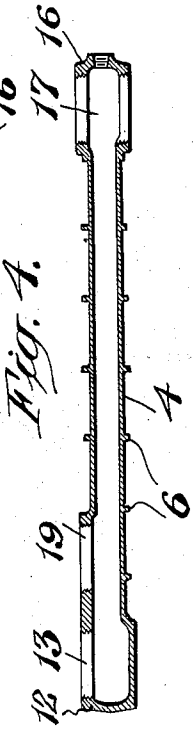


Fig. 4.

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RADIATOR

Filed Dec. 15, 1927 3 Sheets-Sheet 2

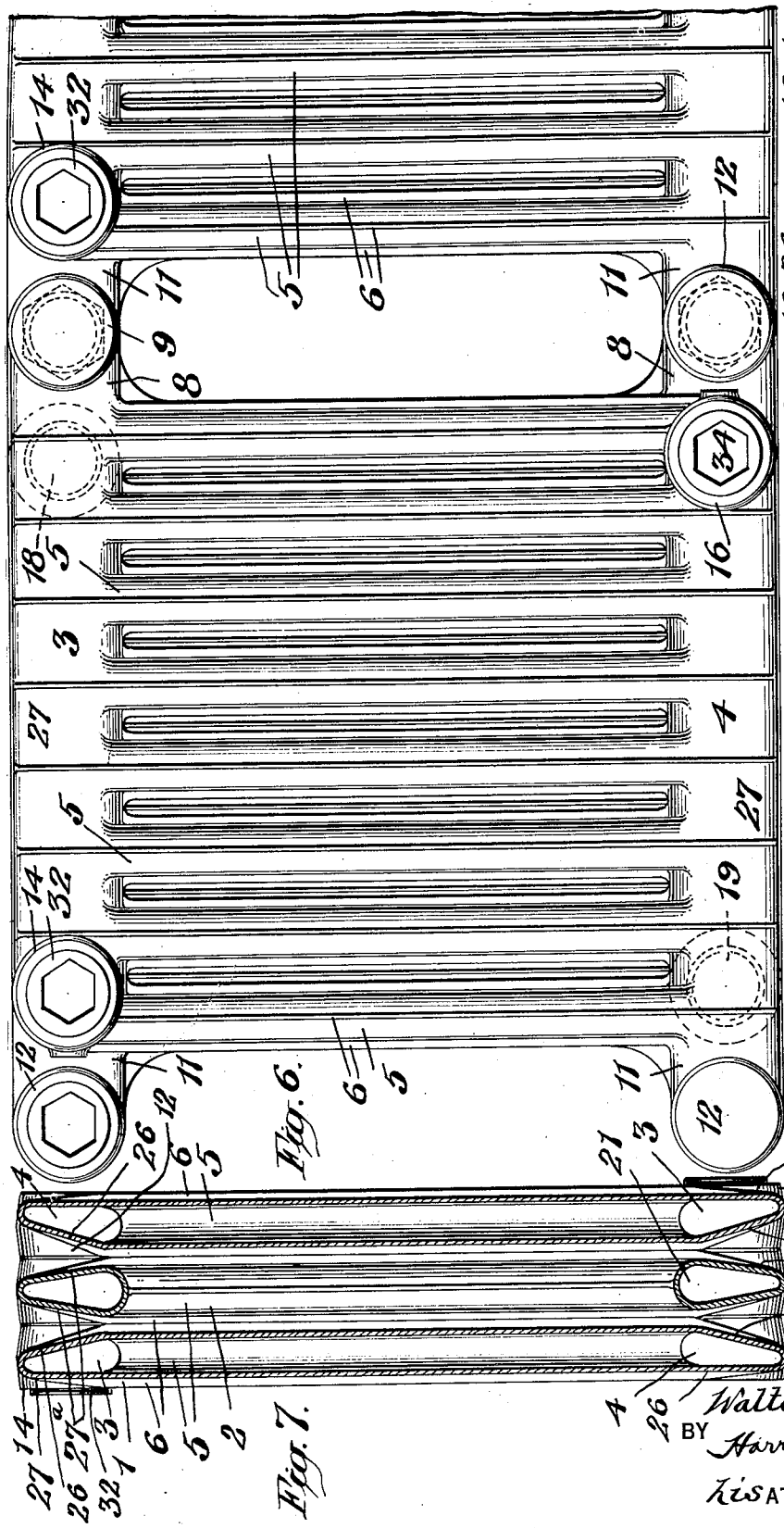


Fig. 6.

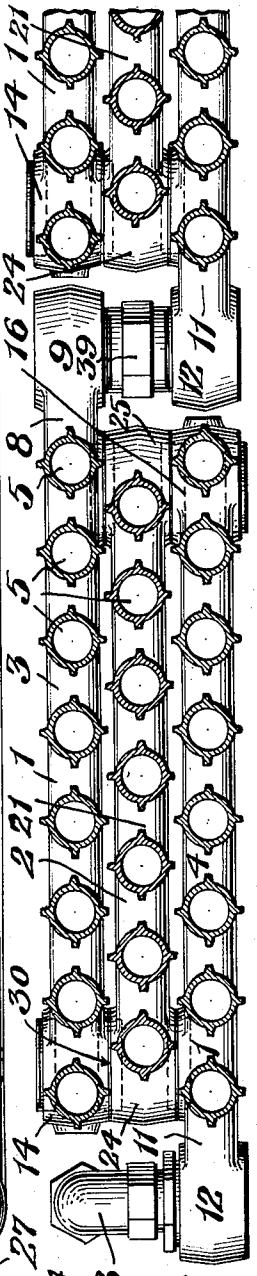


Fig. 8.

Fig. 7.

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RADIATOR

Filed Dec. 15, 1927 3 Sheets-Sheet 3

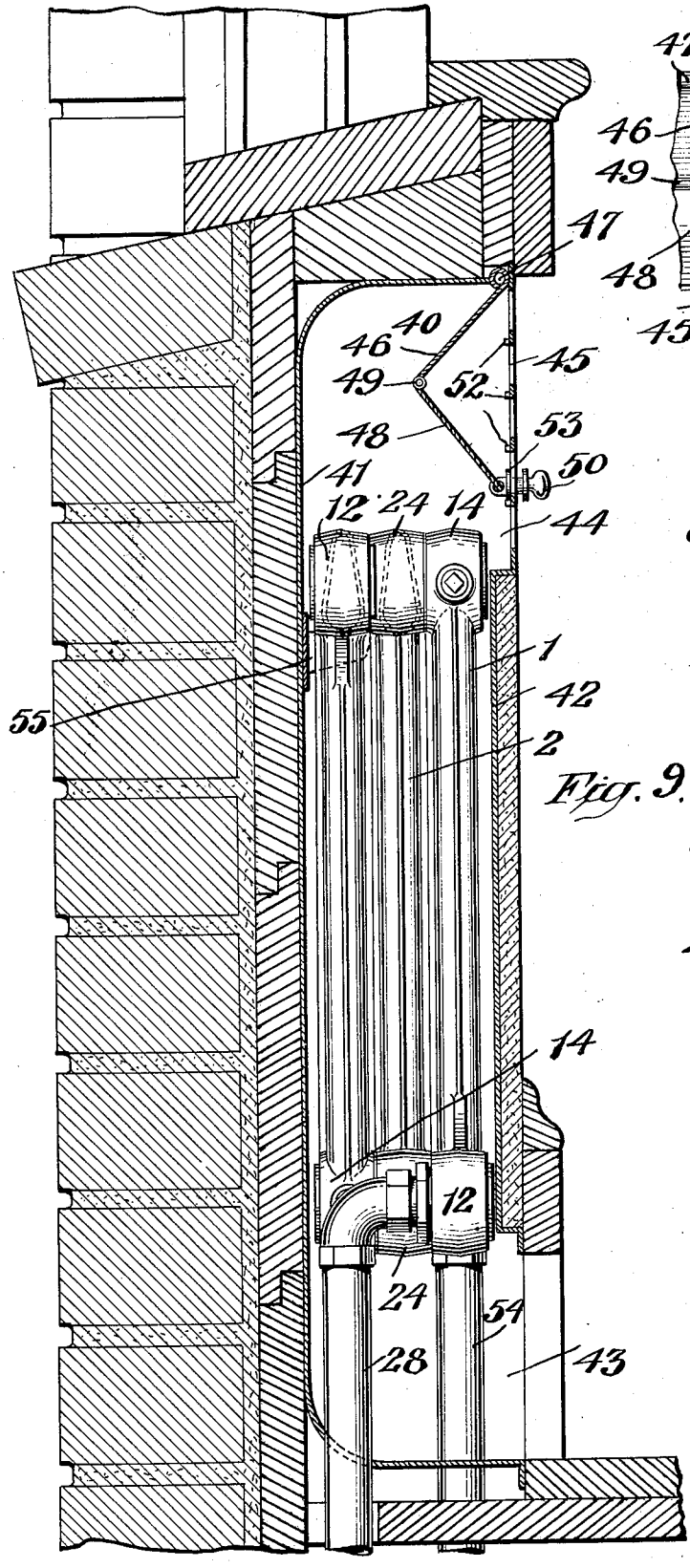


Fig. 9.

Fig. 10.

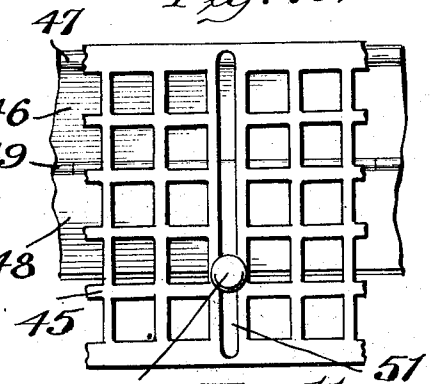
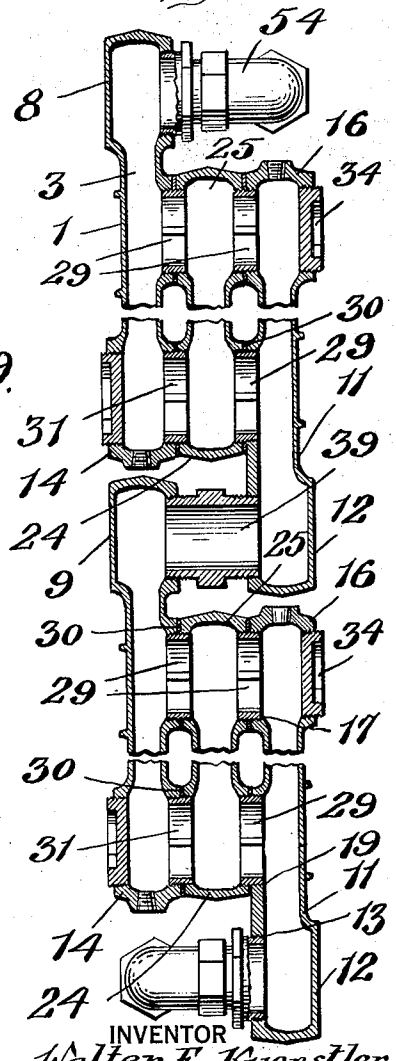


Fig. 11.



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Patented Nov. 26, 1929 1,737,251

UNITED STATES PATENT OFFICE

WALTER E. KUENSTLER, OF NEW YORK, N. Y.

RADIATOR

Application filed December 15, 1927. Serial No. 240,193.

This invention relates to an improvement in radiators for heating purposes, and has for its object to provide an article of this character particularly adapted for "built in" construction, that is, the radiator to which my improvement relates is particularly adapted to be placed in a wall depression thus conserving the space customarily occupied by the conventional type of radiator.

The primary object of my invention is to provide a radiator of the character mentioned which shall be built up of a number of separate sections which may be connected in various ways to accommodate the installation. In other words, my improved radiator may be widened by the addition of as many sections as may be required and it may be lengthened by coupling together a plurality of units. A feature of my invention resides in the fact that the means for joining the sections and coupling the units are so located and positioned that none of these parts extend outside of the plane of the connected sections. The radiator thus produced is extremely neat in appearance and through other features in its construction, extremely effective for heating purposes. Additionally, it has no projecting or protruding parts so that it may be conveniently placed in a wall opening of any depth without having any unsightly protruding pipes, valves or other parts.

With these objects and such other objects as may hereinafter appear, in view, I have devised the particular arrangement of parts hereinafter set forth and more specifically pointed out in the claims appended hereto.

Reference is to be had to the accompanying drawing in which

Figure 1 is a front elevation of one of the primary or main sections of my radiator;

Figure 2 is a front elevation of an inner section of the same;

Figure 3 is a sectional view on the line 3—3 of Figure 1 looking in the direction of the arrows;

Figure 4 is a sectional view on the line 4—4 of Figure 1 looking in the direction of the arrows;

Figure 5 is a sectional view on the line 5—5 of Figure 2 looking in the direction of the arrows;

Figure 6 is a front elevation of my improved radiator showing the manner in which two units are coupled or joined together;

Figure 7 is a vertical sectional view of one of the units disclosed in Figure 6;

Figure 8 is a transverse sectional elevation of the structure disclosed in Figure 6;

Figure 9 is a vertical sectional view of a wall showing the radiator-receiving depression therein and the manner in which a radiator is installed in said depression;

Figure 10 is a front elevation of the heat outlet located above and in front of the radiator; and

Figure 11 is a longitudinal sectional view through the joined units disclosed in Figure 6, said sectional view being taken through the headers at the lower end of said figure.

Throughout the various views of the drawings, similar reference characters designate similar parts.

In the embodiment of my invention disclosed in the accompanying drawing, 1 indicates one of the outer or main sections of my improved radiator and 2 indicates an intermediate section which is generally placed between two of the sections disclosed at 1. The section 2 may however, as will be hereinafter described, be coupled merely to one of the sections 1, this being dependent upon the width of the wall depression in which the radiator is to be installed. The section 1 may be cast in a single piece or it may be made of sheet metal. Regardless of by which method it is made, it consists of an upper, longitudinally extending pipe or header 3 and a somewhat similarly shaped pipe or lower header 4. It will be understood that these two headers project longitudinally of the construction and the same are connected by a plurality of integrally formed pipes or tubes 5. These tubes 5 are preferably provided with a plurality of ribs 6 to afford considerable heating surface and the pipes 5 are spaced by slots or openings 7. The upper header 3 has a projecting end 8 which extends out beyond the end of the outermost

tube at the right of the structure disclosed in Figure 1. This end 8 terminates in a boss 9 which is provided with a connection opening 10.

It will be seen that the opening is thus located in one side of the header 3 and faces inwardly when the structure is viewed from the front as in Figure 1. The lower header 4 is provided with a projecting end 11 which extends out beyond the end of the outermost tube 5 at the left end of the section 1. This projecting end 11 is provided with a boss 12 and also has an opening 13 in its inner side for connection purposes.

It will thus be seen from the construction described that each of the headers 3 and 4 is provided with an extended or projecting end which has a connection opening, the two projecting ends just described being located diagonally opposite to open another in the section. It will be also noted that the header 3 has at its end located opposite to the projection 8 a boss 14 provided with a continuous opening 15 extending completely through the header. The diagonally opposite end of the section is provided with a similar boss 16 and a connection opening 17 extending completely through the boss and open at both sides. It will also be seen from Figure 3 that the upper header 3 has an opening 18 located adjacent to the opening 10 and diagonally opposite in the header 4 is located a smaller opening 19 adjacent to the opening 13 in the projecting end 11.

In Figure 2 is disclosed an intermediate radiator section 2 which is intended to be coupled with one or more sections similar to 1. The section 2 is provided with an upper header 20 and a similar lower header 21, these headers being connected by the tubes 5 previously described with respect to the section 1. The ends of the headers 20 and 21 terminate in bosses 22, 23, 24 and 25, these bosses being perforated for connection purposes as will be explained hereinafter.

By reference to Figures 6, 7 and 8, the peculiar shape of the lower ends of the headers 3, 4, 20 and 21 will be noted. It will be here seen that the headers 3 and 4 are sharply inclined on their faces 26 and less sharply inclined on their outer faces 27. The headers 20 and 21 on the intermediate radiator sections 2 may if desired, have their opposing faces 27^a uniformly inclined.

It will be seen from Figure 7 that when a series of radiator sections are connected together, the lower terminations of the headers will have faces which converge, creating a desired flue effect and producing the heat effectiveness of the device.

The manner in which a plurality of radiator sections may be coupled together is clearly disclosed in Figures 6, 7, 8 and 9. Here it will be seen that there is an outer section, and a similar inner section, the two sections just mentioned being reversed with respect to one another and an intermediate section 2 is connected between them. This connection is established as follows. The boss 12 located on the projecting end 11 is connected to an inlet pipe 28, the opening 19 in the section 1 is connected to the opening 24 by means of a coupling nipple 29, a packing 30 being used in the joint between the meeting parts. The opening 15 in the section 1 is connected to the opening 23 by means of a coupling nipple 31, the outer side of said opening 15 being closed by a closure plug 32. The opening 10 in the projecting end 8 is connected to the opening 13 in the end 11 of the reversed back section 1 on the adjacent unit. The opening 17 in the front section 1 is connected to the opening 25 in the intermediate section, the outer side of this opening being closed by a closure plug 34.

The reversed back section 1 clearly disclosed in Figures 6 and 8 is so arranged that its end 9 is located at the bottom of the installation rather than at the top as is the case with the outer section and its end 11 is located at the top rather than at the bottom as is found in the outer section 1.

Through the arrangement disclosed, it will be seen that when a series of units are placed together, the boss 9 will overlap and align with a projecting end 11 on the adjacent unit, the aligned parts just mentioned being connected together by a nipple 39. This lining together of the units occurs at the top and bottom of each pair of units with the result that a secure and rigid connection is afforded. It will also be seen that in the assembly herein described wherein a pair of outer sections 1 are used with an intermediate section between them, a staggered arrangement of the vertical tubes or pipes 5 is had. In other words, the tubes or vertical pipes 5 on the intermediate sections 2 are so located that the same lie in registration with the spaces 7 located between the tubes 5 on the outer sections 1. Thus, the tubes on the three connected sections are evenly spaced with respect to one another providing an even heating distribution.

It will be seen from the construction described that the radiator units herein mentioned may be assembled in various ways to increase the width of the radiator and the various units formed of a plurality of sections may be readily coupled together to provide a radiator of any desired length. It will also be noted that the projecting overlapping connection bosses on the outer radiator sections are so arranged and are so provided with side openings that the connections between them are located well within the plane of the radiator regardless of the amount of sections that are united. Thus, the radiator is not provided with any projecting parts that might under ordinary conditions interfere

with its installation in a wall space provided for it.

Referring to Figure 9, it will be seen that the radiator is installed in a wall opening 40 which preferably has a metal lining or casing 41 extending behind the radiator. Said casing is also provided with a front protecting portion 42. The inner part of the wall is cut away as at 43 below the radiator and is provided with an upper opening 44 that is covered by a grille 45. A closure arrangement of said grille is shown in the form of a plate 46 which has its upper end pivoted as at 47 and which is provided with a lower section 48. The two sections 46 and 48 are pivoted together by a longitudinally extending pivot 49 and the lower end of the plate 48 is provided with a projecting knob 50 that folds the two parts 46 and 48 relative to one another by vertical movement within a slot 51 provided in the grille.

Adjacent to the slot 51 are provided a series of spaced stops 52 on which a disk 53 provided on the knob 50 may rest to maintain the closure plates 46 and 48 in various positions of adjustment. The radiator may be supported in the wall opening 44 in any desired way. It may be supported upon its inlet pipe 28 and its outlet pipe 54 or a further support for it may be had in the form of brackets 55 secured in the wall space and extending between the vertical pipes 5 and under the upper headers 3 and 20.

From the foregoing, it will be seen that the various sections of my improved radiator are such that the same may be assembled in many ways to provide a radiator of any desired thickness and length. Highly effective heating is secured with my improved radiator through the use of the inclined lower terminals on the headers which increase the draft entering through the opening 43, forcing the warm air out through the grille 45 into the room.

Having described one embodiment of my invention, it is obvious that the same is not to be restricted thereto, but is broad enough to cover all structures coming within the scope of the annexed claims.

What I claim is:—

1. A radiator having front section provided with a plurality of spaced headers, a series of spaced tubes connecting the headers, a similarly formed back section, and an intermediate section located between and connected to the front and back sections, said intermediate section being provided with tubes that are located in alignment with the spaces between the tubes in the front and back sections.

2. A radiator having a main section provided with a pair of parallel connection openings near two of its diagonally opposite ends, one opening of each pair being adapted to be connected to another radiator section to laterally connect said main section to said other section, the remaining opening of each pair serving to connect to a similar radiator unit by connection means extending transversely of the radiator section.

3. A radiator assembly composed of a plurality of connected radiator units, each of said units being provided with extended projecting parts having connection openings whereby a series of units placed together will cause an overlapping of said extended parts and an alignment of the connection openings therein, nipples extending into and connecting the aligned openings, whereby a plurality of radiator units are joined thereby, the extended overlapping parts and connections therefor being located within the plane of the units.

4. A radiator section composed of a pair of spaced headers, tubes connecting the same, one end of each header projecting out beyond the last tube in the section whereby said projecting ends are located diagonally opposite to one another, each of said ends having a pair of parallel connection openings, the mouth of said openings being in the same plane as the body of the radiator section, one of said openings of each pair being adapted for connection to a similar opening in another radiator section and the other opening of each pair receiving a connection nipple extending transversely of the radiator section.

Signed at the city, county and State of New York, this 14th day of December, 1927.

WALTER E. KUENSTLER.