

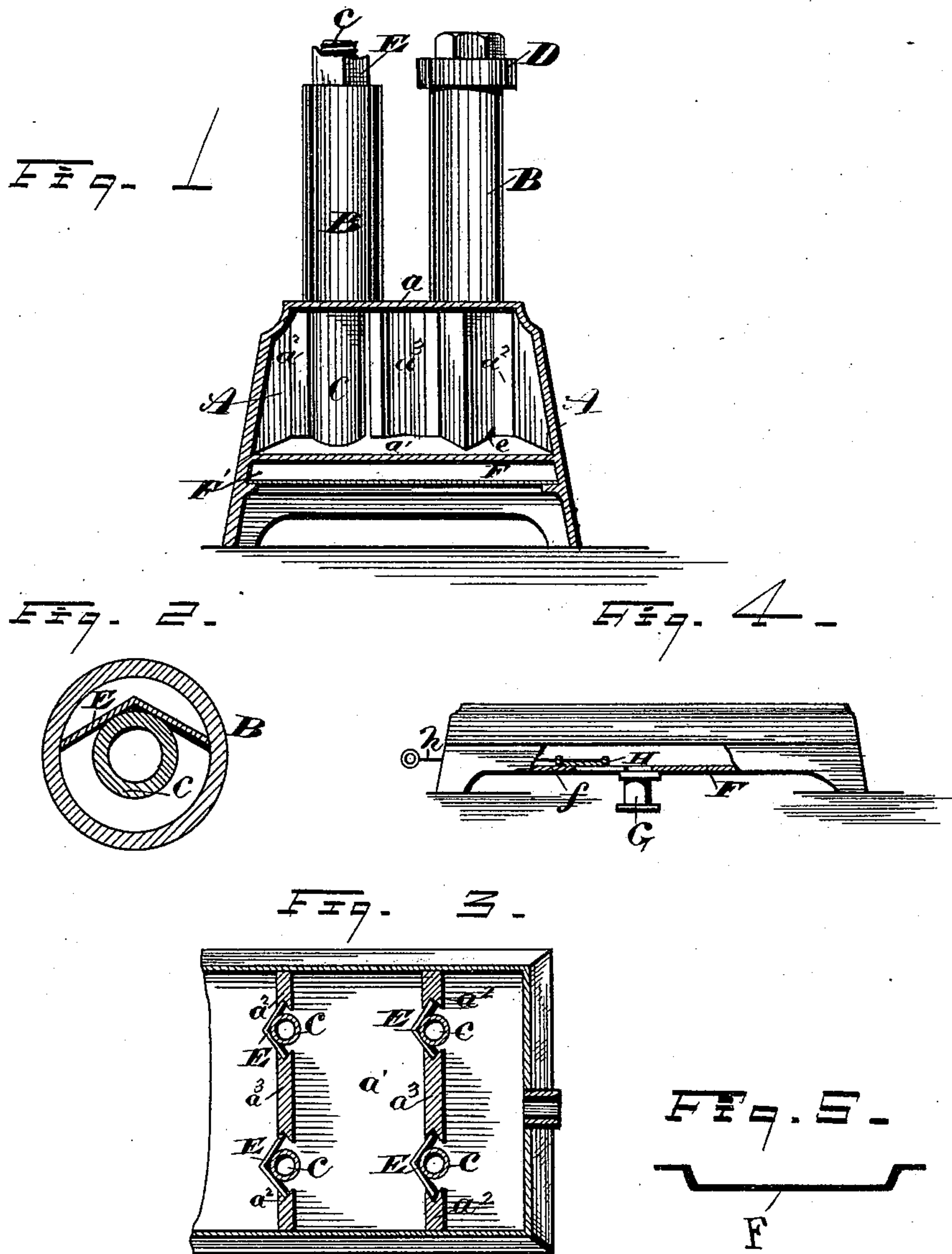
(No Model.)

2 Sheets—Sheet 1.

J. ASKINS.  
RADIATOR.

No. 350,336.

Patented Oct. 5, 1886.



WITNESSES  
*Wm M. Monroe.*  
*Geo. W. King*

INVENTOR  
*Joseph Askins*  
by  
*Leggett & Leggett*  
Attorneys

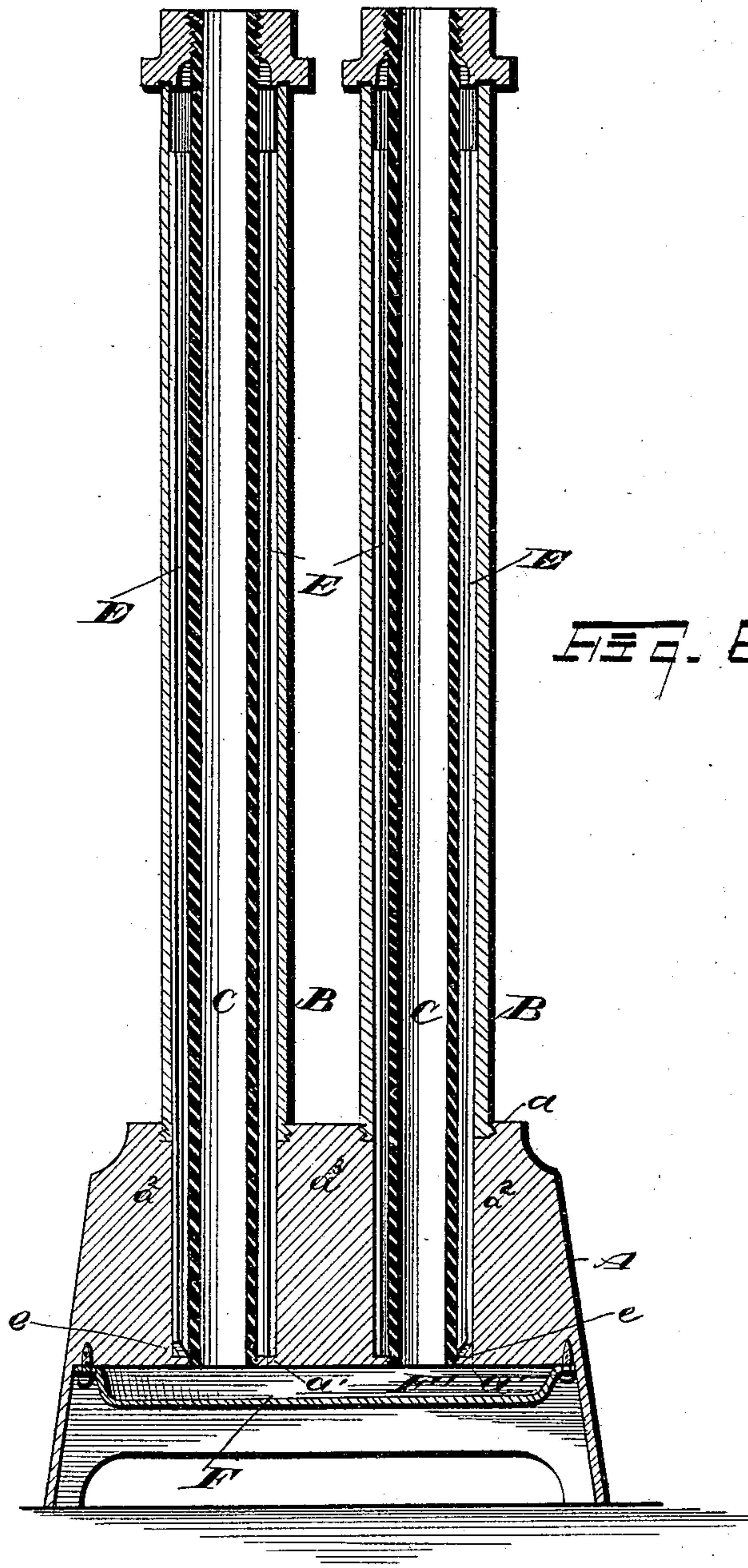
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# UNITED STATES PATENT OFFICE.

JOSEPH ASKINS, OF LIMA, OHIO.

## RADIATOR.

SPECIFICATION forming part of Letters Patent No. 350,336, dated October 5, 1886.

Application filed April 29, 1884. Renewed March 19, 1886. Serial No. 195,862. (No model.)

*To all whom it may concern:*

Be it known that I, JOSEPH ASKINS, of Lima, in the county of Allen and State of Ohio, have invented certain new and useful Improvements in Radiators; 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 pertains to make and use the same.

My invention is an improvement in radiators for steam-heating, the object being to provide vertical air-tubes extending through the steam-tubes, by means of which the air in the inner tubes is heated and caused to rise, thereby causing a continuous air-current up through these tubes.

A further object is to divide the steam-spaces between the inner and outer tubes by metal diaphragms that extend also down through the steam-chamber below, dividing it into compartments, so that the steam in passing from one compartment to the next must pass upon one side of the diaphragm to near the top of the steam-tubes, and down on the opposite side, and by means of which a constant circulation of steam is had through all parts of the radiator, and the air is expelled from the steam-pipes by the direct pressure of the steam.

A further object is to provide an air-chamber under the air-pipe provided with an air-tube leading outside of the building, by means of which pure air may be introduced to the air-tube and heated and discharged into the room.

With these objects in view my invention consists in certain features of construction and in combination of parts, hereinafter described, and pointed out in the claims.

In the accompanying drawings Figure 1 is an elevation of the tubes and a transverse vertical section of the base of the radiator. Fig. 2 is a horizontal section through one of the steam-tubes and the inclosed air-tube and diaphragm. Fig. 3 is a plan view of the bottom plate of the base, the walls and bars of the base and the diaphragm being in section. Fig. 4 is an elevation of the base with a portion broken away to show the removable bottom, valve, and air-duct. Fig. 5 is a transverse vertical section of a modification of the re-

movable bottom, and Fig. 6 is a view in transverse section through the pipes and base.

A represents a hollow base inclosing a steam-chamber, the upper casing, *a*, of which is provided with openings, into which are screwed the steam tubes B, and directly under these openings are smaller ones through the bottom *a'*, into which are screwed the air-tubes C. The upper ends of the air-tubes are threaded, and engage the caps D, that are preferably squared near the top to engage a wrench, and that, when screwed down until the top of the cap is flush with the end of the air-tube, will abut against the top of the steam-tube and form a tight joint therewith. The under side of the cap may be lined with soft metal or other packing—such, for instance, as a copper gasket—to insure a tight joint. Before the caps are screwed on, the diaphragms E are inserted between the tubes B and C. These consist of thin strips of metal bent, as shown in Fig. 2, and when in position between the tubes the edges engage opposite sides of the steam-tubes and the central portion presses against the air-tube, thus dividing the steam-space between these tubes into two parts. These diaphragms extend from near the top of the steam-tubes to the bottom of the steam-chamber *A'* in the base. On the inside of the base, and integral therewith, are the ribs *a''*, arranged opposite the tubes in a lateral direction, and their inner edges flush with the inside of the steam-pipes B. Bars *a'''* extend from top to bottom of the steam-chamber and integral therewith, and the sides thereof are flush with the inside of the steam-pipe. The edges of the diaphragms E engage on one side the edge of one of the ribs and on the other side the edge of the bars *a'''*, so that the ribs, bars, and diaphragms form a partition-wall across the steam-chamber and divide it into compartments. The induction and eduction pipes enter the base at opposite ends in the usual manner. When the steam is admitted, it fills the first compartment, but must pass up one side of the diaphragms and down the other side to enter the next compartment, and so on through the radiator. The air in the radiator has therefore no place for lodgment, but is forced out in advance of the steam, and the radiator will become heated in every



part in a few moments after steam is first admitted. The lower corners of the diaphragms may be clipped, as shown at *e*, to provide a means of escape for the condensed water from one compartment to another toward the education-pipe. These openings *e* are quite small and usually more or less filled with water, so that but a trifling amount of steam can pass through them, and hence do not interfere with the general passage of steam up and down the pipes, as aforesaid. A bottom, *F*, preferably detachable, is secured below, inclosing an air-chamber, *F'*, from which air is supplied to the air-tubes *C*. An air-pipe, *G*, leads to the outside of the building, through which pure air may be admitted to supply the pipes *C*. An opening, *f*, is arranged near the mouth of the pipe *G*, and a damper, *H*, is provided with the rod *h*, attached, by means of which the damper may be moved so as to close the mouth of the pipe *G* or the opening *f*, according as it is desired to admit air from the outside of the building or from the room to supply the tubes *C*. The base of the heater may have a pendant flange, to which the bottom *F* may be attached, or the part *F* may be dish-shaped, as shown in Figs. 5 and 6. The part *F* may be cast integral with the base of the heater; but I prefer to make it detachable, so that in case the radiator is to be used when the part *F* and attachments are not required they may be omitted, and thus save expense.

I am aware that it is old to provide radiator-tubes with diaphragms arranged longitudinally therein, whereby a circulation of steam is created through said tubes. I am also aware

that it is old to divide the base of a radiator in a series of sections so connected by pipes or tubes that the steam after it leaves one section is forced to pass through the pipes connecting said section with another section before it can enter said latter section.

What I claim is—

1. In a radiator, the combination, with a base having a steam-chamber and an air-chamber, of air pipes or tubes secured to the floor of the steam-chamber and communicating with the air-chamber, a steam-pipe surrounding each air-pipe and secured to the roof or upper plate of the steam-chamber and communicating with said chamber, diaphragms located within the spaces between the steam and air pipes, and extending from near the top of said pipes to the bottom of the steam-chamber, and ribs or walls located within the steam-chamber, the said ribs or walls and the diaphragms dividing the steam-chamber into a series of compartments, substantially as set forth.

2. In a radiator, the combination, with the base provided with a steam-chamber and an air-chamber the floor of which is detachable, and provided with air-ducts and a valve, as described, of the air-tubes, the steam-tubes, the diaphragm, and the ribs or walls  $a^2$   $a^3$ , all of the above parts arranged as described.

In testimony whereof I sign this specification, in the presence of two witnesses, this 9th day of April, 1884.

JOSEPH ASKINS.

Witnesses:

B. F. SCHWAB,  
W. A. ROVER.