(No Model.) 2 Sheets—Sheet 1.

F. MARAK, Jr.

RADIATOR.

No. 339,442. Patented Apr. 6, 1886.

Fig. 3.
on x-x

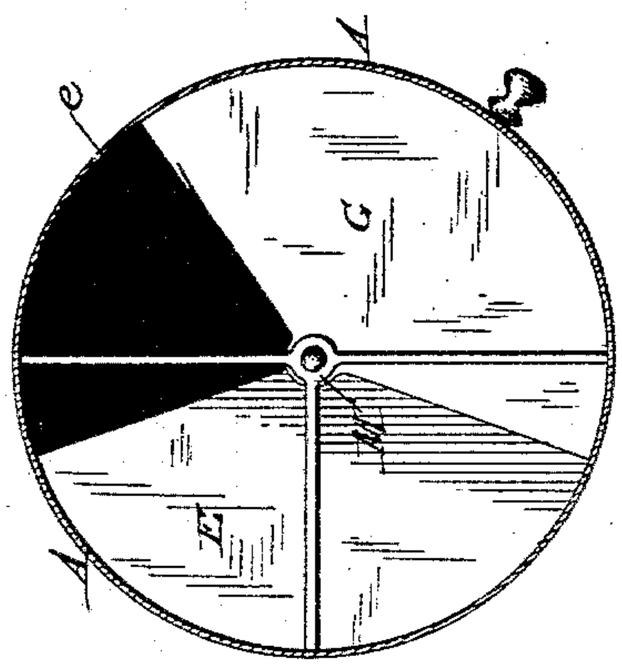


Fig. 4.

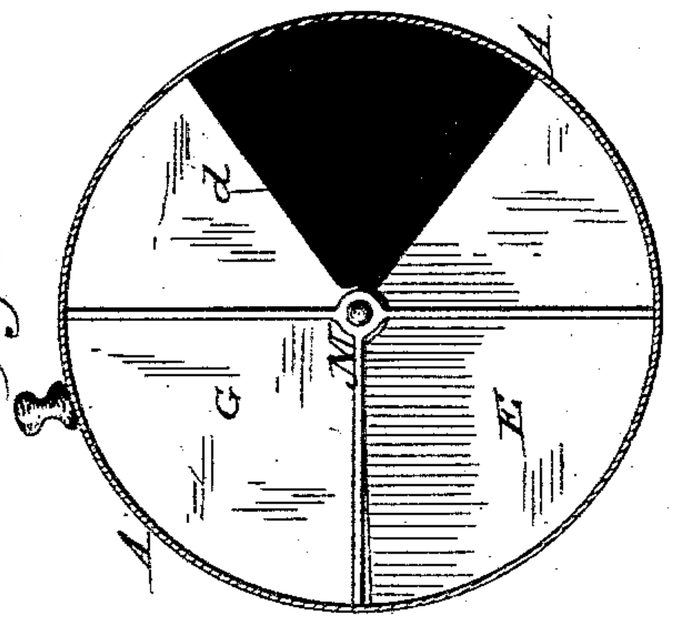


Fig. 2.

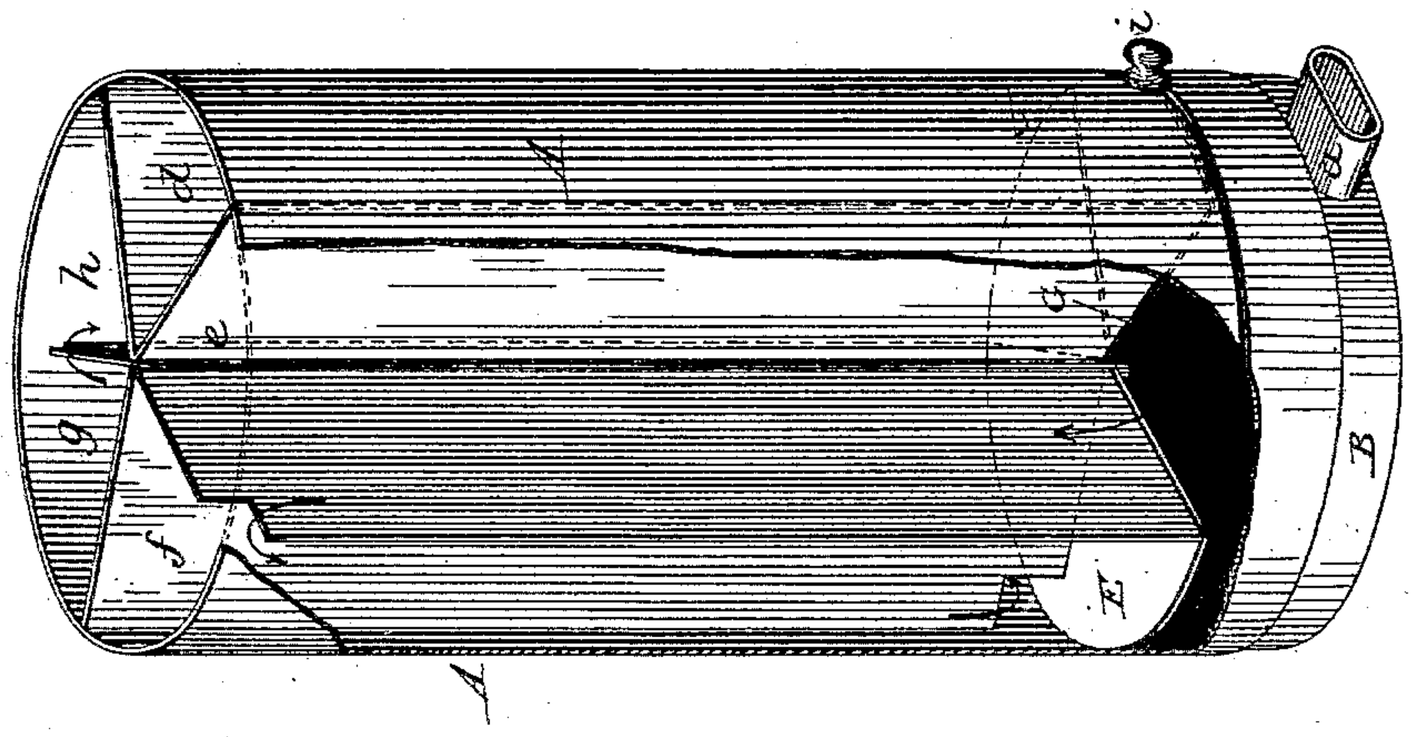
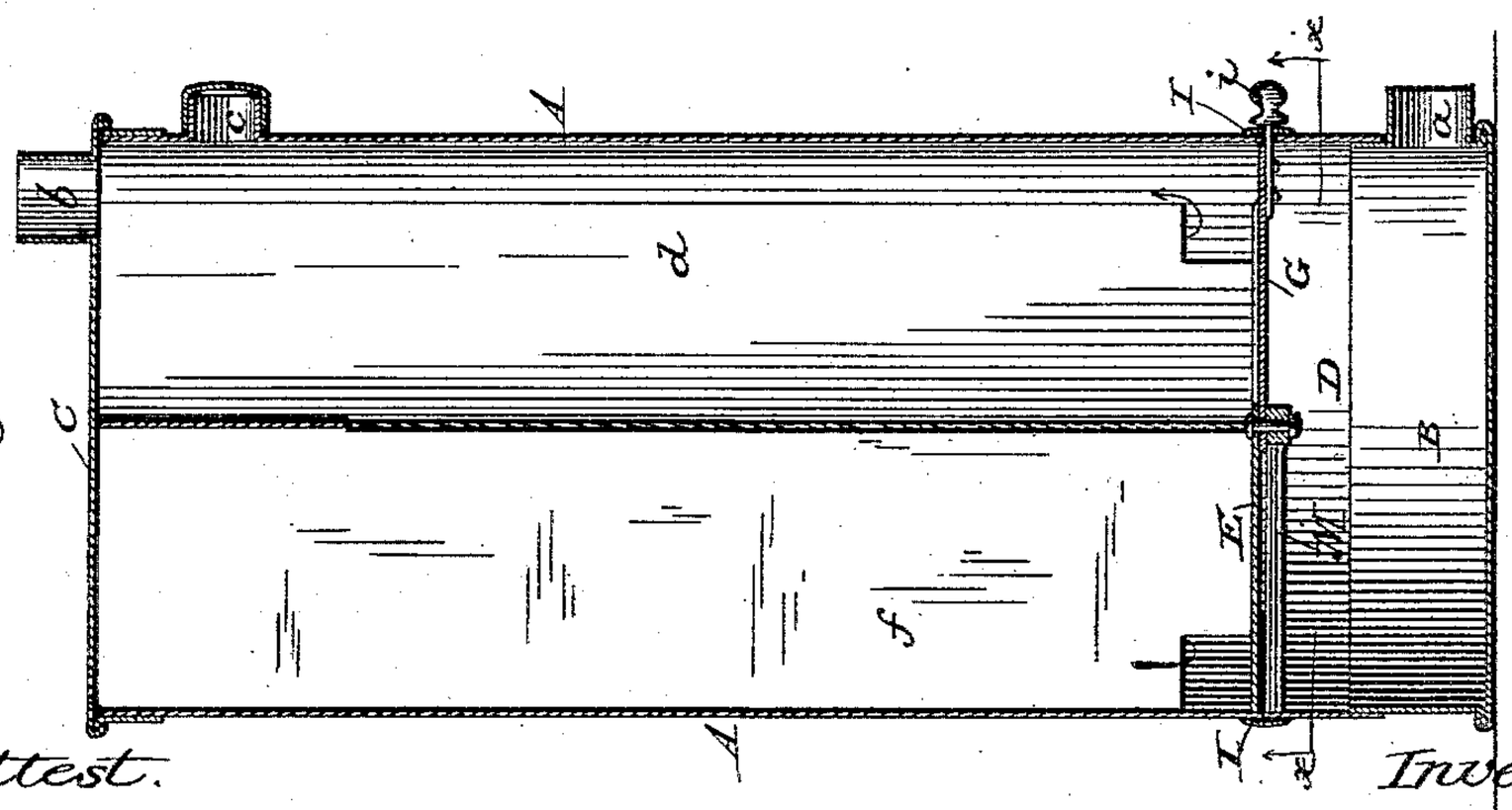


Fig. 1.



Attest.

Sidney P. Hollingsworth

Harry Shipley

Inventor

Francis Marak. Jr

By his Attorney.

Philip T. Dodge.

(No Model.) 2 Sheets—Sheet 2.

F. MARAK, Jr.

RADIATOR.

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Fig. 8.

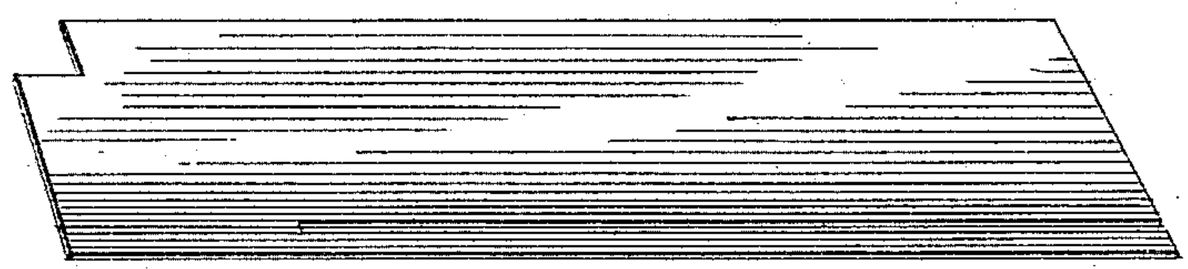


Fig. 7.

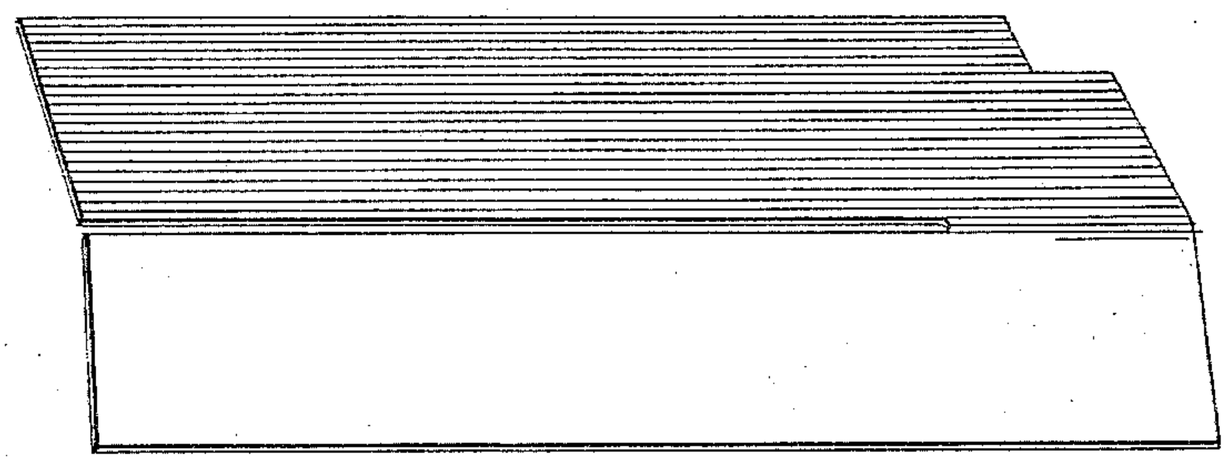


Fig. 6.

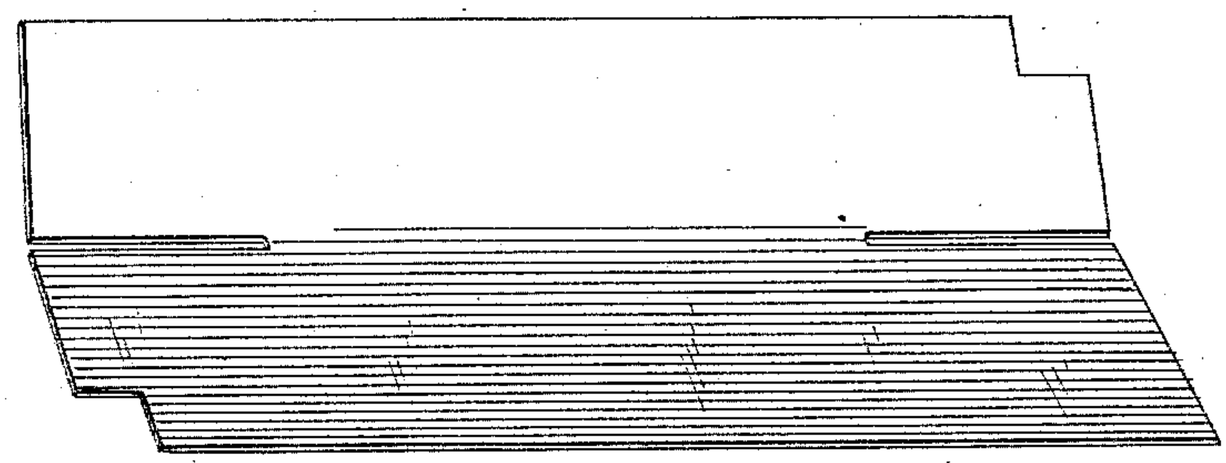
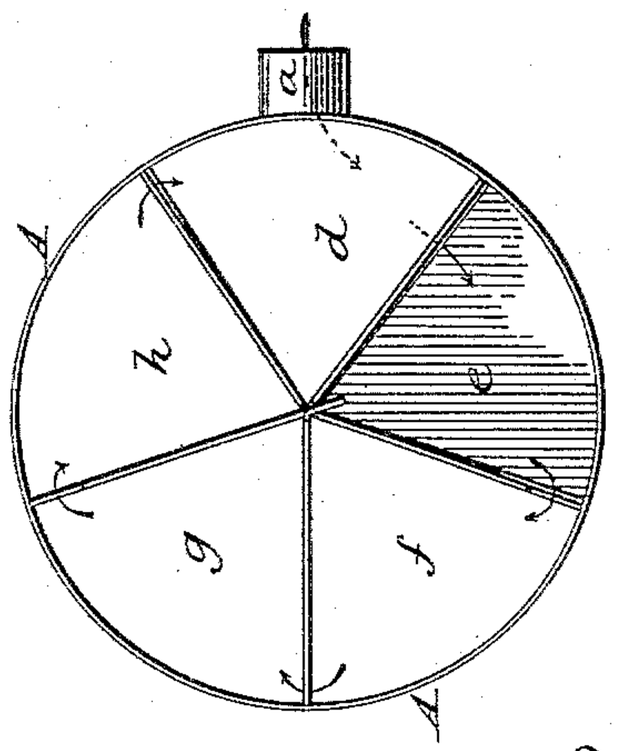


Fig. 5.



Attest.

Sidney P. Hollingsworth

Harry Shipley

Inventor.

Francis Marak. Jr.

By his attorney

Philip T. Dodge.

UNITED STATES PATENT OFFICE.

FRANCIS MARAK, JR., OF EVEREST, KANSAS.

RADIATOR.

SPECIFICATION forming part of Letters Patent No. 339,442, dated April 6, 1886.

Application filed March 17, 1884. Serial No. 124,585. (No model.)

To all whom it may concern:

Be it known that I, FRANCIS MARAK, Jr., of Everest, in the county of Brown and State of Kansas, have invented certain Improvements in Radiators, of which the following is a specification.

The object of this invention is to provide a cheap, simple, and compact radiator or heating-drum, which may be instantly adjusted in such manner as to permit the heated air, gases, or currents to pass directly through the same or to compel them to pursue a circuitous or serpentine course before escaping, so that an increased radiation of the heat may be secured.

Referring to the accompanying drawings, Figure 1 represents a vertical central section through my radiator. Fig. 2 is a perspective view of the same, with the external shell or body partially broken away to expose the internal parts to view. Fig. 3 is a horizontal section on the line *x x*, looking upward, the valve being in position to secure the serpentine or circuitous passage of the current. Fig. 4 is a similar view of the valve in position to permit the direct passage of the current. Fig. 5 is a top plan view of the radiator, the cap or cover being removed to expose the partitions and chambers. Figs. 6, 7, and 8 are perspective views showing the construction of the partitions or diaphragms by which the body is divided into longitudinal chambers.

A represents the body or drum of the radiator, made of sheet metal in an elongated cylindrical form. It is tightly closed at its upper and lower ends by means of caps or covers B and C, which are provided with annular flanges fitted tightly to the ends of the body. The lower cap, B, is provided with a neck or mouth, *a*, through which the heated air, smoke, and products of combustion enter the radiator, while the upper cap, C, is provided with a neck, *b*, through which the air, gases, &c., are discharged. If desired, the upper end of the body may be provided with a laterally-extending neck, *c*, to admit of connection being made to the side of the apparatus in special cases. This neck *c* is ordinarily closed by means of a cap or cover, as shown in the drawings.

As represented in the various figures of the drawings, the body is divided into five longitudinal flues or chambers, *d*, *e*, *f*, *g*, and *h*, by means of sheet-metal partitions, which extend from the center of the body to the walls of the same, as plainly represented.

As shown in Figs. 1 and 2, the partitions terminate at a distance of a few inches from the bottom of the body, thus leaving in the base below the partitions a chamber, D, occupying the entire space beneath them. This chamber is separated from the lower ends of the flues by means of an intervening plate or partition, E, which is secured rigidly in place in the foot of the body, the partition serving to prevent the smoke and gases which enter the chamber B from passing into the flues, except in the manner hereinafter described.

The partition E is provided, as represented in Figs. 3 and 4, with an opening of a size and form corresponding with the lower ends of the two flues *d* and *e*, the former being the flue with which the outlet-neck *b* communicates at the top. Beneath the stationary plate E, I pivot at the center of the apparatus a sector-shaped plate or valve, G, which is free to turn in a horizontal direction, its edge being provided with a handle, *i*, extending outward through a horizontal slot in the side of the body, in order that it may be readily adjusted from the exterior. This plate is of a size and form corresponding with the opening in the plate E—that is to say, of a size and form corresponding with the ends of the two flues *d* and *e*. By turning the plate to the left it is caused to close the lower end of the flue *e* and open the lower end of the flue *d*, as represented in Fig. 4, thus permitting the air and smoke to pass upward from the bottom chamber, D, directly through the flue *d*, and outward through the discharge-neck *b*. It will be understood that when the currents are thus permitted to pass directly through the body there will be a comparatively small radiation of heat. If the valve, however, be moved to the right instead of the left, it will close the lower end of the flue *d* and open the lower end of the flue *e*, as represented in Fig. 3, so that the air, smoke, &c., will be compelled to pass from the bottom chamber, D, into the flue *e*, whence it can pass to the outlet only by the serpentine course, which will now be described.

The successive partitions are provided at

their upper and lower ends alternately with openings, which afford communication between one of the longitudinal chambers and the next, in the manner plainly represented in Fig. 2. The chamber *e* communicates at its upper end with the chamber *f*, the latter at its lower end with the chamber *g*. The chamber *g* communicates at its upper end with the chamber *h*, and the latter in turn at its lower end with the chamber *d*. As a consequence of this construction the air and products entering the chamber *e*, when the valve is adjusted as in Fig. 3, ascend through the same to the upper end and thence through the opening into the chamber *f*, through which they descend and pass to the chamber *g*. Ascending the last-named chamber they escape from its top into the chamber *h*, and descending the latter pass therefrom into the foot of the chamber *d*, through which they ascend, and finally escape at the outlet neck, as in the first instance. It will be seen that the current is thus compelled to traverse the entire length of the body five times before escaping, the effect of this retardation being to cause a great radiation of heat. By adjusting the valve in intermediate positions, so as to cause the currents to pass partly in a direct and partly in an indirect course, the radiation may be controlled as demanded.

The internal partitions may be soldered or otherwise secured in place at the inner and outer edges, and may each consist of a perfectly rectangular sheet of tin or other metal. It is preferred, however, on account of the greater cheapness, to adopt the construction represented in Figs. 6, 7, and 8. A sheet of metal adapted to extend entirely across the body and form two of the partitions is cut to the form represented in Fig. 6, with notches in its upper and lower corners on opposite sides, and with narrow slits or incisions extending centrally inward from the two ends. A second sheet—such as shown in Fig. 7—notched in one corner, is provided with a long central incision extending inward from one end nearly to the other. This sheet is also of sufficient width to extend across the body and form two partitions. A third sheet, intended to form a single partition, is made in the form represented in Fig. 8, a notch or opening being formed in one corner, and a longitudinal slit being formed near the opposite edge from one end nearly to the other. These three sheets, being slipped together in an endwise direction, each entering the slits or incisions of the others, may be slid endwise to their places within the body, and being thus introduced they will remain in position, receiving support from each other and from the surrounding body in such manner that they have no tendency to work out of position.

It will be observed that the openings from each chamber to the next are located at the outer edges of the partitions, or, in other words, at points near the surface of the drum. This arrangement is advantageous, in that it causes the heated products to pass to the surface of the drum in order that the heat may be more effectively radiated.

In order to prevent leakage from the horizontal slot in which the handle of the valve is moved, I attach to said handle a plate or ring, I, encircling the drum and covering the slot.

The valve G is sustained and the parts supported by means of an internal skeleton frame, M, secured in the body below the valve, as shown in Figs. 1, 3, and 4.

Having thus described my invention, what I claim is—

In a radiator, the cylindrical body having a chamber in its base and inlet and outlet necks at its ends, in combination with the division plates or partitions provided with longitudinal slits or incisions and united substantially as described and shown.

FRANCIS MARAK, JR.

Witnesses:
MATHIAS KRIER,
J. P. WAGNER.