Aug. 7, 1923. 1,464,269

F. G. KRAKAN

RADIATOR

Filed March 31, 1921

Fig. 1.

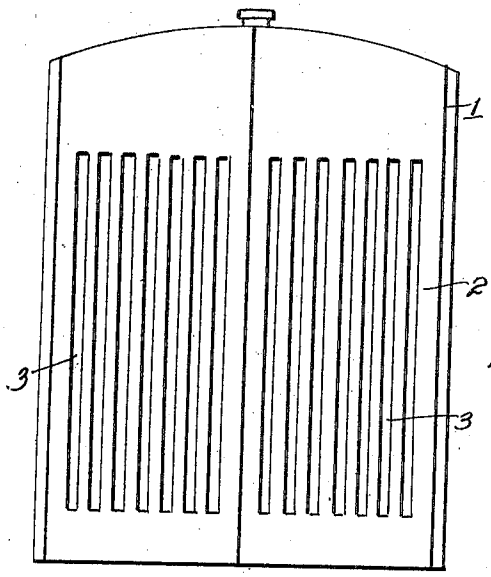


Fig. 2.

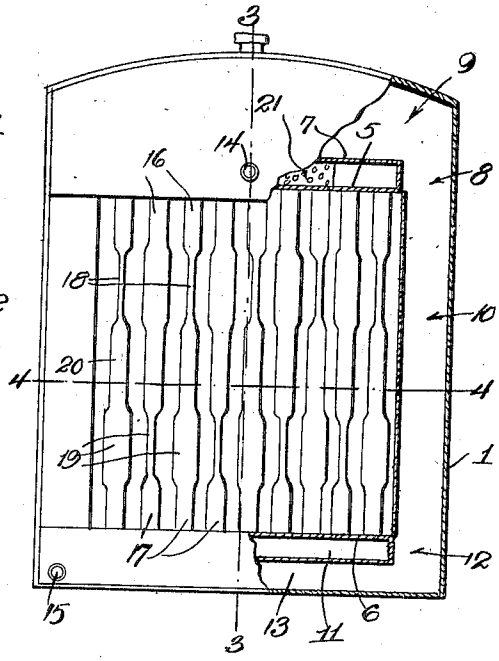
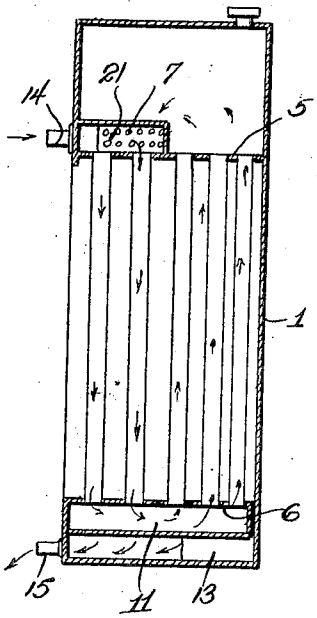


Fig. 5

Fig. 3.



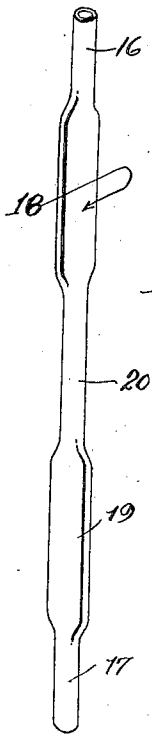


Fig. 4.

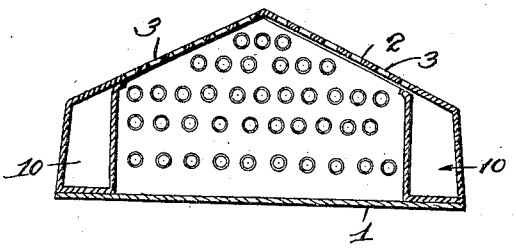
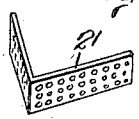


Fig. 6.



Inventor

Frank G. Krakan

Patented Aug. 7, 1923. 1,464,269

UNITED STATES PATENT OFFICE.

FRANK G. KRAKAN, OF PITTSBURGH, PENNSYLVANIA.

RADIATOR.

Application filed March 31, 1921. Serial No. 457,206.

To all whom it may concern:

Be it known that I, FRANK G. KRAKAN, a citizen of the United States, residing at Pittsburgh, in the county of Allegheny and State of Pennsylvania, have invented certain new and useful Improvements in Radiators, of which the following is a specification.

The primary object of this invention is to provide an improved structure for radiators so that the circulation of water through the tubes will be varied whereby a quicker cooling of the water will be accomplished.

One of the objects of the invention is to provide a specific construction for the vertical water tubes whereby the course of the water will be changed without necessarily interposing any fittings in the tubes.

Other objects of the invention will appear upon consideration of the following detail description and accompanying drawings, wherein:—

Figure 1 is a front elevation of the radiator constructed in accordance with my invention,

Figure 2 is a rear elevation parts being broken away to more clearly disclose the structure,

Figure 3 is a vertical section taken on the line 3—3 of Fig. 2,

Figure 4 is a transverse section taken on the line 4—4 of Fig. 2,

Figure 5 is a detail view of one of the tubes.

Figure 6 is a detail perspective view of one of the water deflecting plates.

Referring to the drawing by numerals, the radiator is of any preferred construction with respect to its frame work and general dimensions and includes the outside casing 1 which has its front wall 2 formed with two angular surfaces which are provided with vertical slots 3 to permit a free passage of air. The slots may consist of openings of any other form, so that air will freely circulate through the radiator.

Arranged within the outside casing is an inner frame work which consists of the top wall 5 and the lower wall 6, both walls being in a horizontal plane and extending from the front to the rear of the housing. The top wall is provided with an inlet compartment 7 which extends transversely across the top of the wall 5, but is less in length than the width of the housing so that a space 8 is provided to establish communication between the top space or intermediate chamber 9 and side passage ways 10 provided at opposite sides of the inner frame work. A lower distributing compartment 11 is arranged beneath the lower wall 6 and this compartment extends entirely across the bottom wall from the front to the rear of the outside casing and is the same length as the upper compartment 7 whereby communication is established as indicated at 12 between the passage-ways 10 and the bottom space or discharge chamber 13 located below the compartment 11. An inlet tube 14 communicates with the inlet compartment 7, and an outlet tube 15 communicates with the discharge chamber 13.

A plurality of vertically arranged tubes are located in the space between the upper wall 5 and the lower wall 6 and have their ends extended through the walls so that communication is established through the tubes between the upper intake and intermediate chambers and lower space or distributing chamber. As shown in Fig. 5, each tube consists of an elongated cylindrical pipe having its upper end 16 and its lower end 17 perfectly cylindrical so that the ends of the tubes may be fixed in the upper and lower walls 5 and 6. The intermediate portions of the tubes are pressed and flattened as indicated at 18 and 19, the central portion between the two flattened portions remaining cylindrical as indicated at 20. The flattened portion 18 is disposed at right angles to the flattened portion 19 and it will be obvious that if tubes of greater lengths are provided, a greater number of flattened portions may be provided if desired.

The tubes are arranged so as to constitute two different sets. The three rows of tubes at the front of the radiator establish communication between the upper space or intermediate chamber 9 and the lower compartment or distributing chamber 11 while the two rows of tubes at the rear of the radiator establish communication between the upper compartment or inlet chamber 7 and the lower compartment or distributing chamber 11. A V-shaped water deflecting plate 21 is located in the upper compartment or inlet chamber 7 so that water entering through the inlet tube 14 is deflected and distributed through the entire set of tubes communicating with said intake chamber. Said plate 21 is preferably perforated to permit a limited passage of water there-

through, and through its assistance the distribution of the water over the entire surface of the bottom of the inlet chamber is accomplished. It is to be understood that the apex of the V-shaped plate 21 is disposed toward and in alinement with the pipe 14.

When the water enters the inlet tube 14 it is received in the upper compartment or inlet chamber 7 and deflected by the deflecting plate 21 so that the water passes downwardly through the rear set of tubes into the lower compartment or distributing chamber 11. From this compartment, the water passes upwardly through the forward set of tubes into the top space or intermediate chamber 9, and is then conducted downwardly through the side passage-ways 10 to the lower space or discharge chamber 13 and is discharged through the outlet tube 15 to a water tank or pump. The construction of the tubes causes the water, passing through the tubes to be somewhat retarded in its course, thus creating an extremely thin film of water at certain intervals so that a greater cooling effect may be had.

Minor changes may be made in the details of construction without departing from the spirit of the invention or the scope of the claims hereunto appended.

What is claimed is:—

1. A radiator comprising an outside casing, an inner structure including upper and lower walls, closing the upper and lower portions of the casing, a compartment formed on the upper walls, a compartment formed beneath the lower wall, the said compartments and walls being arranged to provide upper and lower water spaces, and vertical tubes connected to the upper and lower walls, some of the tubes extending between the upper and lower compartments other tubes extending between the upper space and the lower compartment, the said inner structure having side walls parallel with the side walls of the casing to provide vertical passage-ways communicating with the upper and lower spaces at the top and bottom of the said casing.

2. A device of the class described comprising a housing, a horizontally disposed wall within the housing near its upper end to form a top space, a horizontally disposed wall near its lower end to form a bottom space, vertically extending walls connecting the horizontally disposed walls to provide passage ways at opposite sides of the housing which communicate with the top and bottom spaces, a plurality of vertically disposed tubes extending between the walls to provide a plurality of passage ways, a casing associated with the upper wall and inclosing the ends of certain of said tubes, a casing associated with the bottom wall and inclosing all of the lower ends of said tubes, an intake pipe connected to the housing and opening into the upper casing, and a discharge pipe entering the casing and communicating with the bottom space.

In testimony whereof, I have affixed my signature in the presence of two witnesses.

FRANK G. KRAKAN.

Witnesses:
H. A. BURDICK,
FRANK R. WESLEY.