Aug. 8, 1961 F. J. QUATTRINI 2,995,342

TANK FOR SECTIONAL TYPE RADIATORS

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Fig. 1

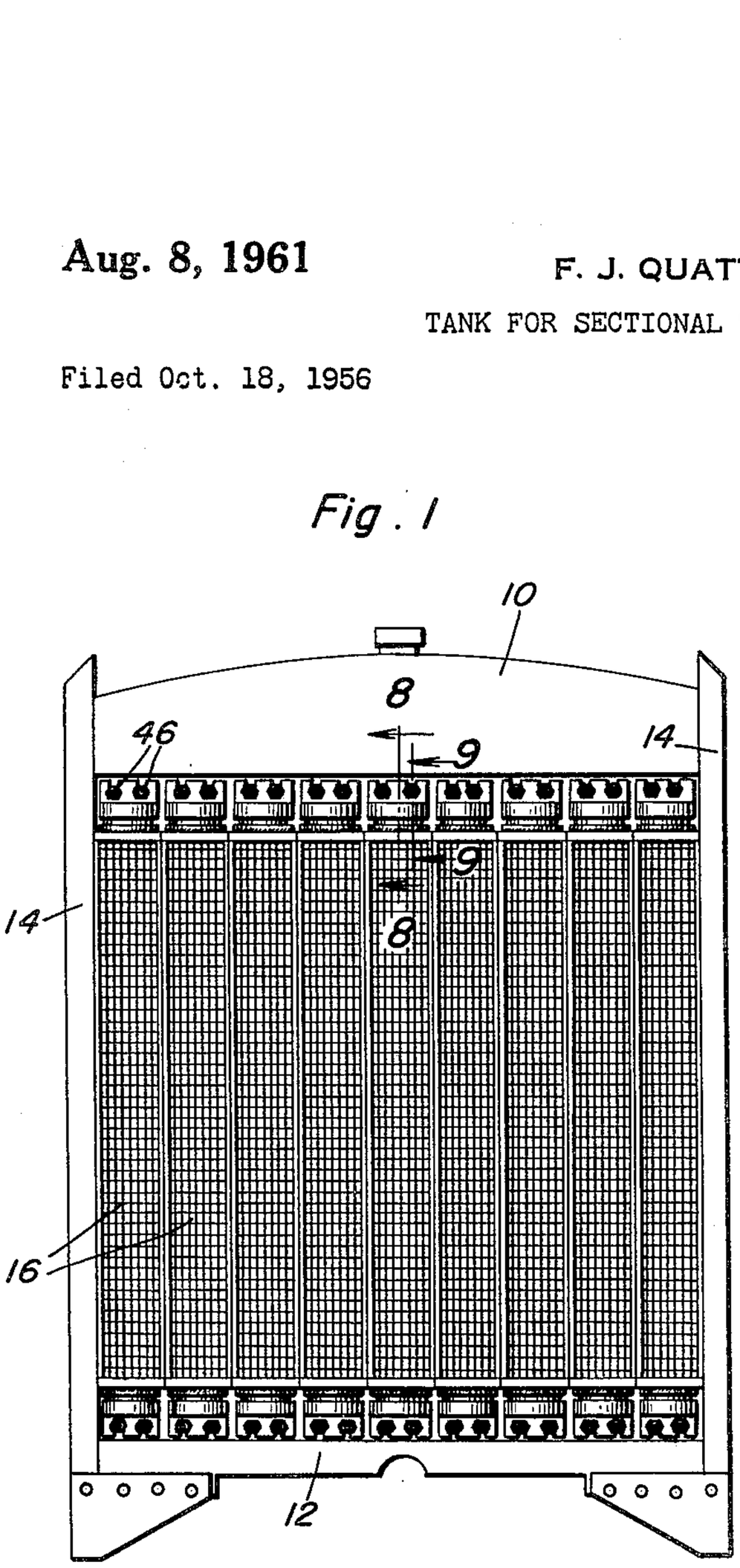


Fig. 2

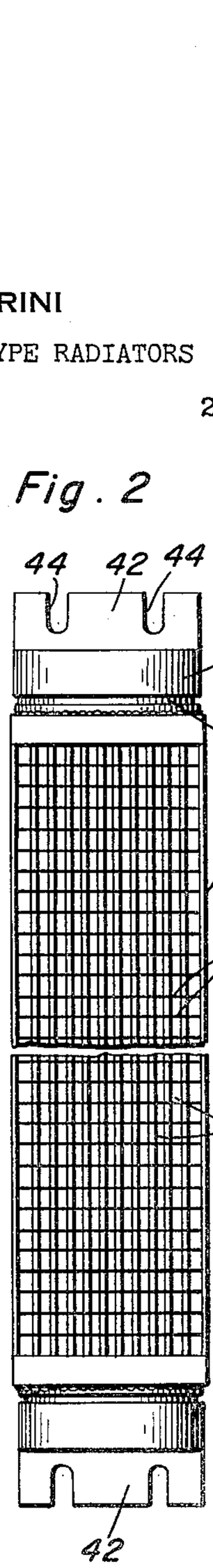


Fig. 3

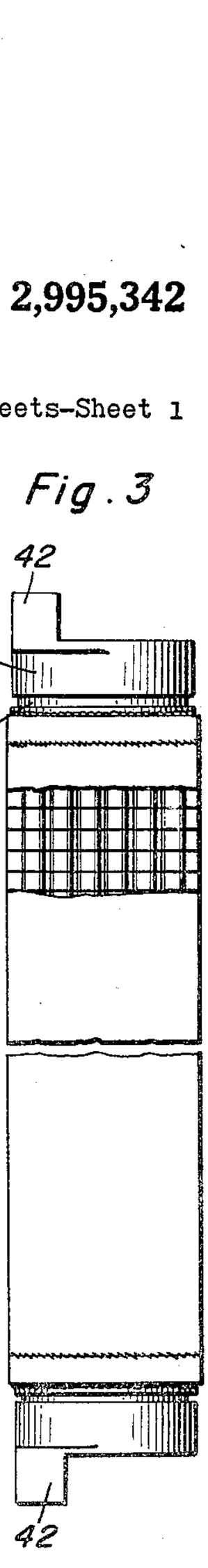


Fig. 5

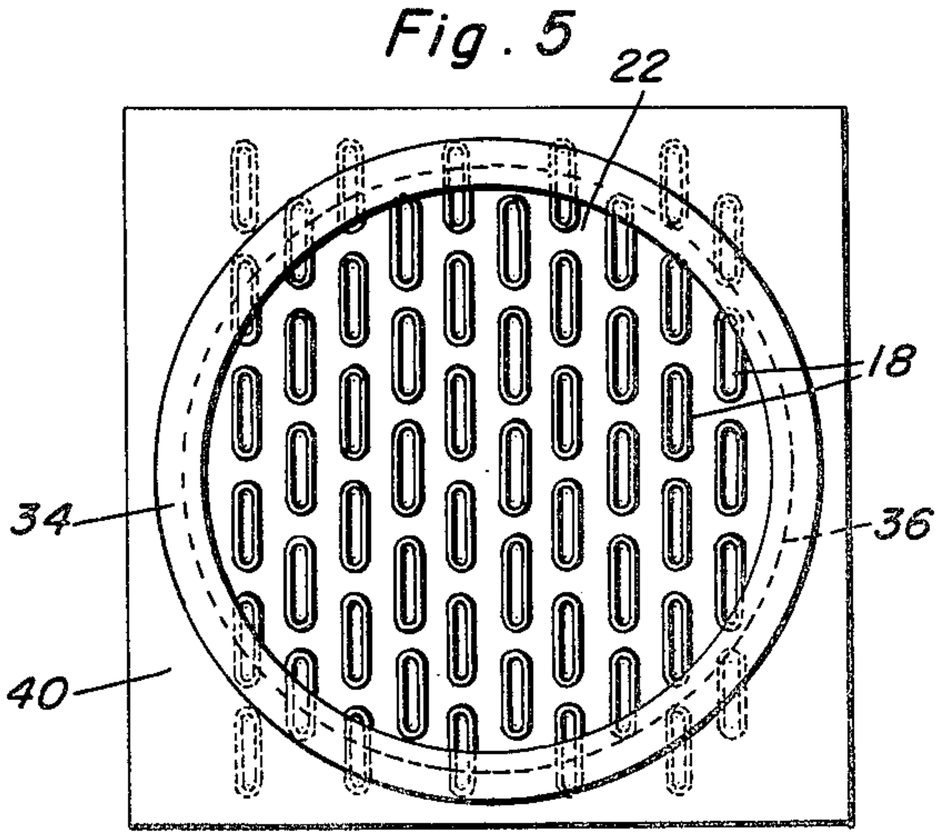
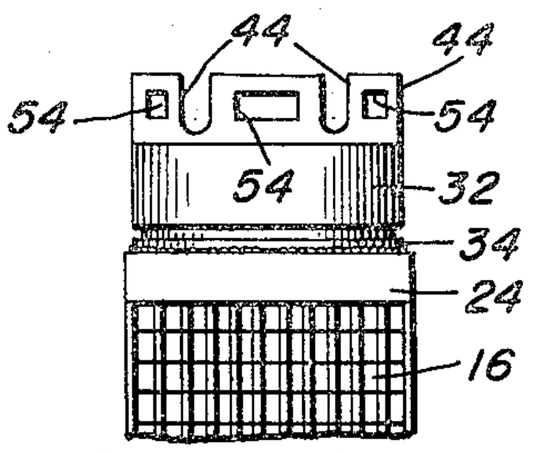


Fig. 4



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TANK FOR SECTIONAL TYPE RADIATORS

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Fig. 10

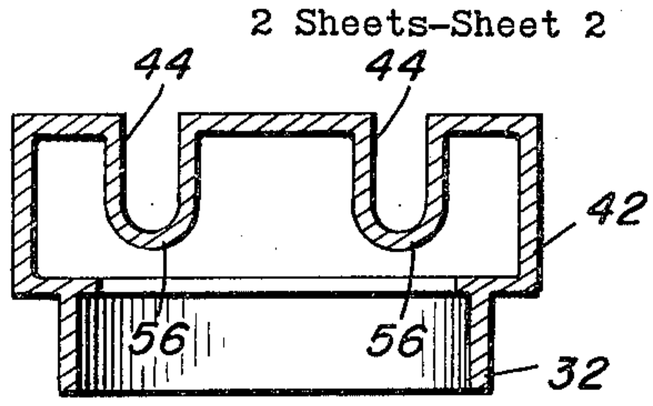


Fig. 8

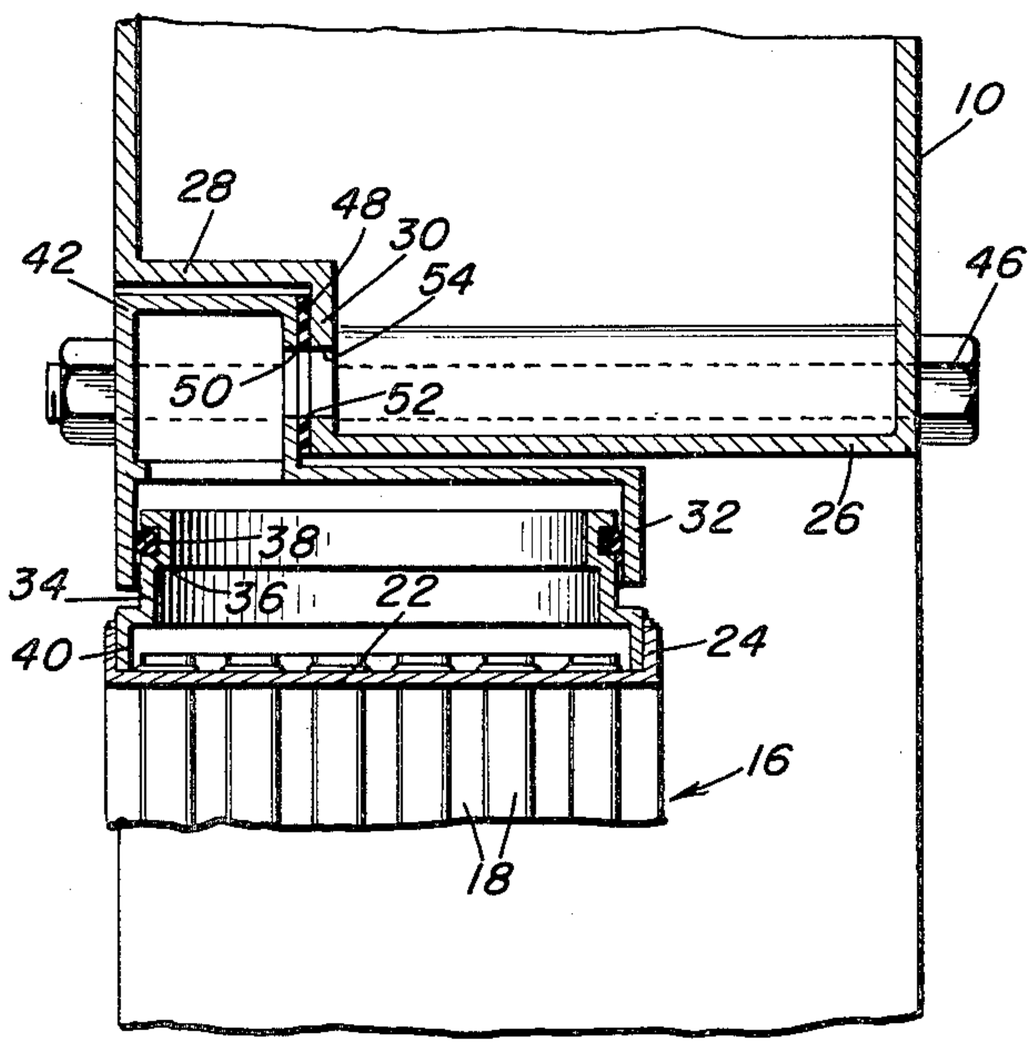


Fig. 6

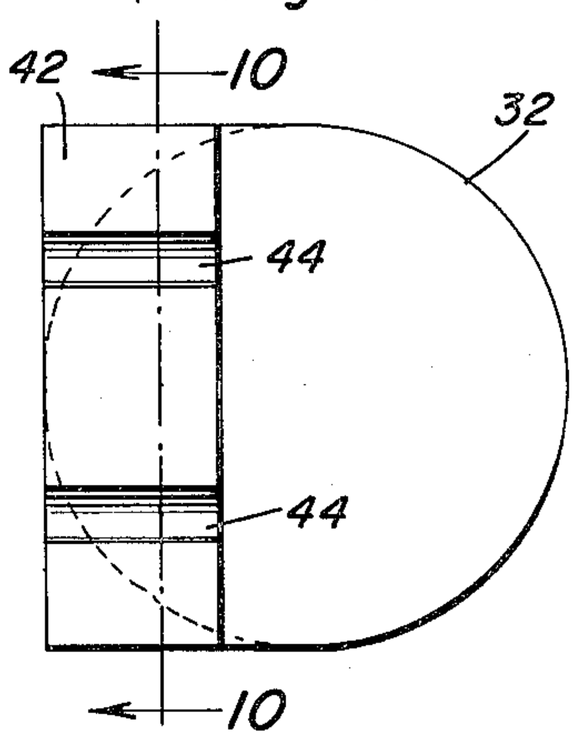


Fig. 9

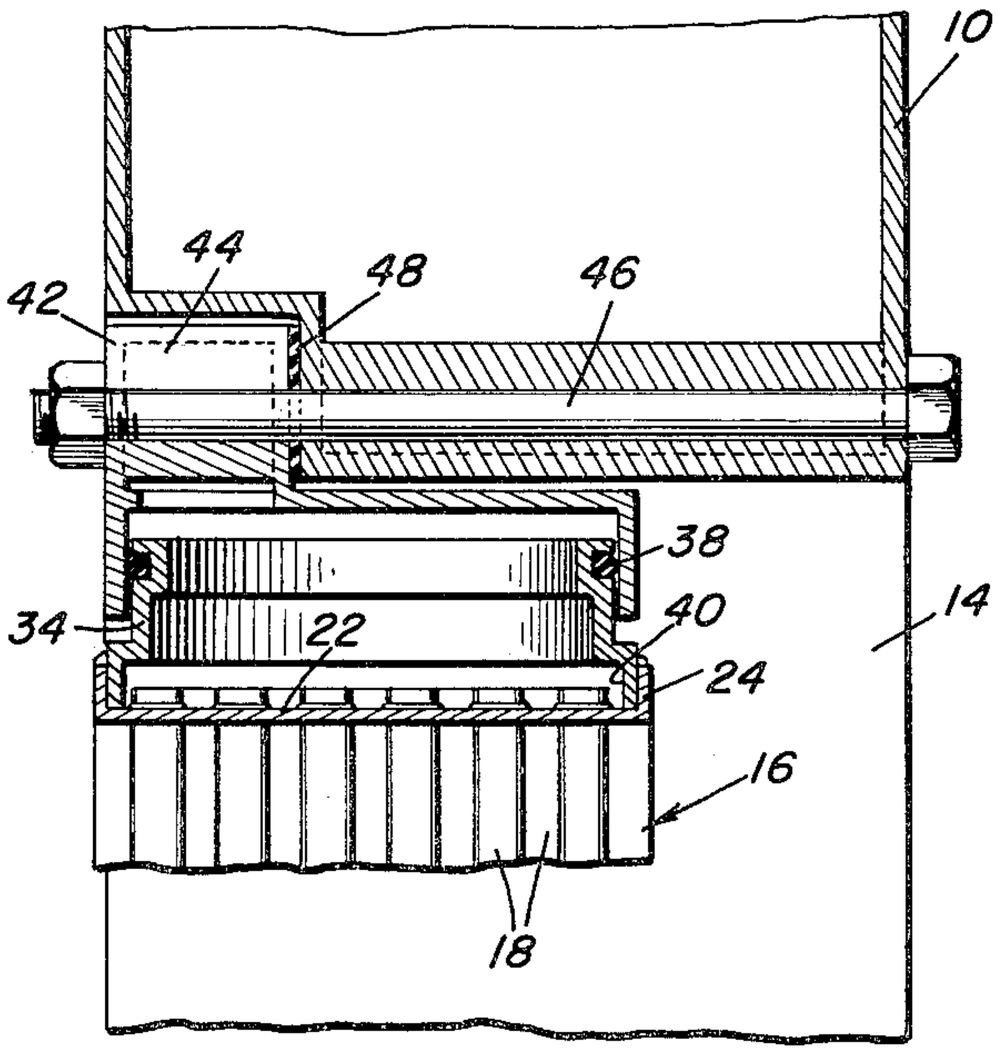
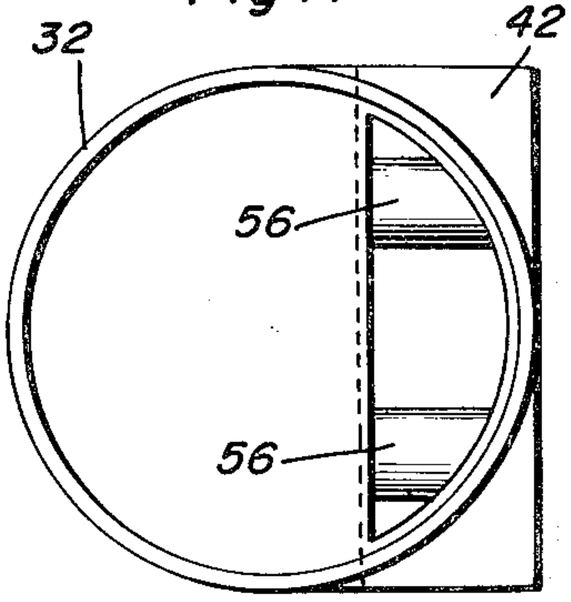


Fig. 7



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TANK FOR SECTIONAL TYPE RADIATORS

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4 Claims. (Cl. 257—129)

This invention comprises a novel and useful tank for sectional type radiators and more particularly pertains to an expansion joint construction specifically adapted for securing the sectional cores of radiators to the upper and lower tanks thereof.

In conventional types of sectional core radiators, and particularly those adapted for use with internal combustion engines, the conventional radiator construction includes upper and lower tanks having connected therebetween sectional core assemblies. In order to vary the capacity of such radiators it is customary to provide core sections of different lengths which thus vary the overall distance between the upper and lower tanks and thereby vary the water content and cooling capacity of the sectional core radiator. This heretofore has necessitated the providing and storing of a considerable number of different lengths of sectional cores, which frequently differ from each other by as little as one-quarter of an inch in length. Moreover the assembling of a radiator necessitates a rather painstaking and laborious operation of welding or securing the tank sections to the header plate assemblies at the opposite ends of the core sections.

It is a primary purpose of this invention to provide a construction whereby the providing of radiators having different capacities and different distances between their tank sections may be readily effected while employing a single size of sectional cores therein; and without the necessity for welding or soldering the tank assemblies to the sectional cores.

A further important object of the invention is to provide an improved radiator construction in accordance with the foregoing objects wherein the tubes of the sectional cores may be relieved from such strains as are customarily imposed by the expansion and contraction of the tubes under temperature differences during the operation of the radiator.

An additional important object of the invention is to provide a sectional core radiator construction in accordance with the foregoing objects which shall have a construction whereby the tank sections may be secured operatively to the sectional cores in an improved manner facilitating the applying, removing or changing of the sectional cores therein; and wherein a heat expansion compensating provision between the tank sections and the sectional cores may be provided.

These together with other objects and advantages which will become subsequently apparent reside in the details of construction and operation as more fully hereinafter described and claimed, reference being had to the accompanying drawings forming a part hereof, wherein like numerals refer to like parts throughout, and in which:

FIGURE 1 is a front elevational view of a conventional type of sectional core radiator incorporating therein the principles of this invention;

FIGURE 2 is a front elevational view, partly broken away, of a radiator sectional core to which the expansion joint construction of this invention has been applied;

FIGURE 3 is a view similar to FIGURE 2 but taken in elevation from the right side of the same;

FIGURE 4 is a fragmentary rear elevational view of the expansion joint construction of FIGURE 2;

FIGURE 5 is a top plan view of one end of a sectional core of a radiator having a sleeve member of the expansion joint construction of this invention applied thereto, the other member of the expansion joint construction being omitted therefrom;

FIGURE 6 is a top plan view of the upper or outer member of the expansion joint construction;

FIGURE 7 is a bottom plan view of the member of FIGURE 6;

FIGURE 8 is a detail view taken upon an enlarged scale substantially upon the plane indicated by the section line 8—8 of FIGURE 1 and showing in particular the manner in which the expansion joint construction is operatively connected to the upper end of a sectional core of a radiator and to the upper tank assembly of the same;

FIGURE 9 is a view upon an enlarged scale taken substantially upon the plane indicated by the section line 9—9 of FIGURE 1 and showing in particular, in the same manner as FIGURE 8, the manner in which the expansion joint construction is operatively connected to the upper end of a sectional core and to the upper tank assembly of a radiator construction; and

FIGURE 10 is a detail view taken in vertical section substantially upon the plane indicated by the section line 10—10 of FIGURE 6.

Referring primarily to FIGURES 1, 8 and 9 it will be seen that a conventional form of sectional core radiator construction for which the present invention is particularly adapted consists of upper and lower tank assemblies 10 and 12 which are mounted between side frame members 14 and 14 in order to provide a rigid framework for the radiator, and which further includes a plurality of sectional cores 16, nine such cores being shown in FIGURE 1.

Each of these cores 16 comprises a plurality of vertically extending tubes 18 which extend through vertically spaced horizontally extending fins 20 which are secured to the tubes in good heat exchange relation. The upper and lower end of these tubes extend into and are bonded to crown sheets 22 having peripheral upstanding flanges 24.

Referring now especially to FIGURES 8 and 9 it will be seen that the upper tank assembly 10 includes a bottom wall comprising a main portion 26 and a vertically spaced portion 28 connected by a vertically extending wall 30. This wall provides a vertical seating surface for a purpose which will be subsequent apparent. It will be understood that the lower tank assembly 12 is of similar construction to that of the upper tank assembly 10 previously described and illustrated, and accordingly illustration of the same in the drawings has been omitted in the interest of simplifying the drawings.

Operatively interposed between the tank assemblies 10 and 12 and the sectional cores 16, in accordance with this invention, is an expansion joint assembly establishing communication between the tanks and the tubes 18 of the sectional cores 16, permitting variation in the overall length of the sectional core assemblies, and establishing a fluid-tight sealing connection between the tank assemblies and the sectional cores.

Attention is now directed more specifically to the expansion joint construction whose construction and association with the tank assemblies constitutes the present invention. Referring first to FIGURES 8 and 9 it will be seen that the expansion joint assembly consists of upper and lower telescoping sleeves 32 and 34 respectively, one of these sleeves such as the lower sleeve having an annular groove 36 therein for receiving an O-ring 38. The lower sleeve and its O-ring are slidably received within the lower portion of the upper sleeve in a manner to permit relative longitudinal movement between the two sleeves, while retaining a fluid-tight engagement therebetween.

The lower sleeve terminates in a depending flange 40 which is preferably square or of the same configuration as the upstanding flange 24 on the crown or header plate

22 of the sectional core unit 16, and is intended to be soldered or welded thereto to form a rigid part of the core assembly. It will of course be understood that the same construction of expansion joint is secured to the lower portion of each sectional core assembly 16 for cooperation with the lower tank assembly 12.

The upper portion of the upper sleeve 32 is provided with an upstanding rib or housing 42 at the front side of the radiator. This upstanding rib, as will be best apparent from FIGURES 1, 8 and 9, is adapted to be received in the recess formed by the surfaces 28 and 30 of the upper tank assembly, or in corresponding recesses of the lower tank assembly, not shown. The upstanding rib 42 constitutes a means whereby the upper tank assembly is rigidly secured to the expansion joint assembly and thus is operatively connected to the sectional core assemblies.

Referring now particularly to FIGURES 2, 4, 6 and 10 it will be seen that the upper surface of the upstanding rib 42 is provided with downwardly projecting slots or notches 44. These notches are adapted to register with fastening bolts 46 which extend through the tank assemblies 10 or 12, and by means of a gasket 48 interposed between the seating surface of the vertical wall 30 and the adjacent surface of the upstanding rib 42, secure the rib and the expansion joint to the tank assembly.

The interior of the rib is hollow as will be best apparent from FIGURE 10 and communicates with the interior of the lower sleeve 34 and thus with the tubes 18 of the sectional core. Upon that vertical wall of the rib which is adjacent to the side wall 30 of the tank, there are provided registering ports 50 which cooperate with apertures 52 in the gasket or packing member 48, and with ports or apertures 54 in the wall 30 of the tank. Thus, communication is established from the tanks 10 or 12 to the interior of the expansion joint assembly and to the sectional cores of the radiator which are connected therewith.

From a comparison of FIGURE 10 with FIGURES 6 and 7 it will be observed that the top surface of the upstanding rib 42 is provided with a depressed wall to provide the notches 44 on the upper side and to provide the depending ribs 56 upon the lower side thereof.

By this construction, a single length of sectional core may be stepped and by means of the expansion joints consisting of the axially slidable concentric sleeves 32 and 34, the standard size of sectional cores may be adapted to and secured to differently spaced sets of upper and lower tank assemblies, thus obviating the necessity for stocking a large number of sizes of sectional cores of slightly different lengths. Moreover, in view of the slip joint construction of the upper and lower sleeves 32 and 34, satisfactory provision is made for the effects of temperature expansions and contractions of the sectional cores during the operation of the radiator, thereby obviating a frequent cause of mechanical failure of radiator sectional cores in the past.

Moreover, the slip joint construction of the upper and lower sleeves of the expansion joint together with the O-ring packing construction therefor permit easy engagement or disengagement of the cores from the tank units, thus greatly facilitating replacement or repair and servicing of a radiator construction embodying this invention.

The foregoing is considered as illustrative only of the principles of the invention. Further, since numerous modifications and changes will readily occur to those skilled in the art, it is not desired to limit the invention to the exact construction and operation shown and described, and accordingly, all suitable modifications and equivalents may be resorted to, falling within the scope of the invention as claimed.

What is claimed as new is as follows:

1. In a water-cooled sectional core radiator, a tank having a front vertical face with its lower portion laterally recessed rearwardly therefrom providing a recessed vertical mounting surface, a plurality of vertically elongated sectional radiator cores, a securing means for each core securing the latter to said tank and establishing communication between said tank and said core, said securing means comprising an upper member and a lower member communicating with each other, means connecting said upper and lower members together in fluid tight relation and allowing for relative movement between said members, said upper member having a flat top disposed in close proximity to and underlying the bottom of said tank, a hollow upstanding rib rising from the front portion of said upper member and received in said laterally recessed lower portion of said tank, means securing the rear face of said rib to said vertical mounting surface, means establishing communication between said tank and said rib, said lower member being secured to the upper end of said sectional core and being in fluid tight engagement therewith, said rib having rearwardly extending vertically depressed notches in its top surface, said securing means comprising bolts extending through said rib and lying in said notches and being vertically movable into and out of said notches.

2. The combination of claim 1 wherein said last mentioned means establishing communication between said tank and rib comprises passages in said rib lying between said notches and communicating through said vertical mounting surface with said tank.

3. The combination of claim 2 wherein said upper and lower members have telescoping rotatably slidable portions, said connecting means comprising fluid tight sealing means between the adjacent surfaces of said portions.

4. The combination of claim 1 wherein said upper and lower members have telescoping rotatably slidable portions, said connecting means comprising fluid tight sealing means between the adjacent surfaces of said portions.

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