

May 31, 1955

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2,709,564

BRACKET FOR FINNED RADIATOR TUBES

Filed Feb. 15, 1952

2 Sheets-Sheet 1

FIG. 1

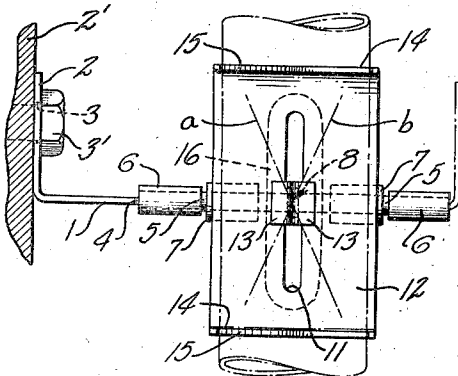


FIG. 4

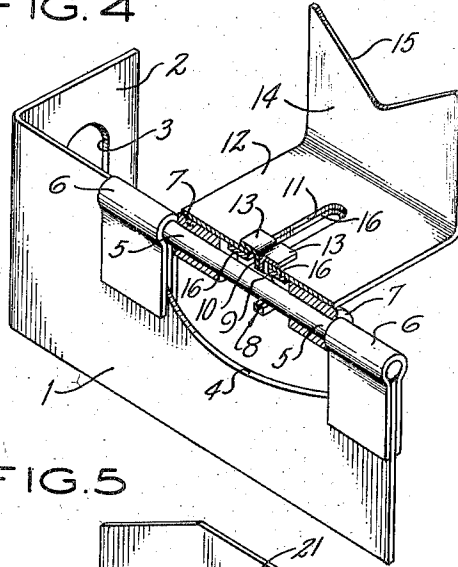


FIG. 2

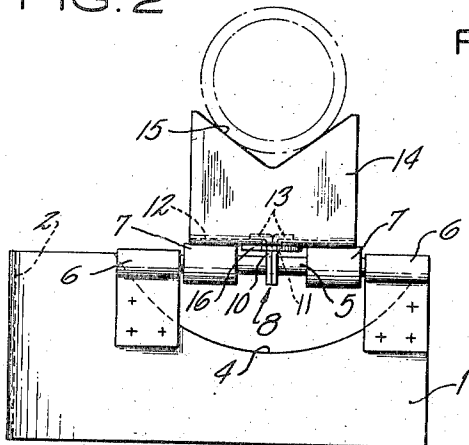


FIG. 5

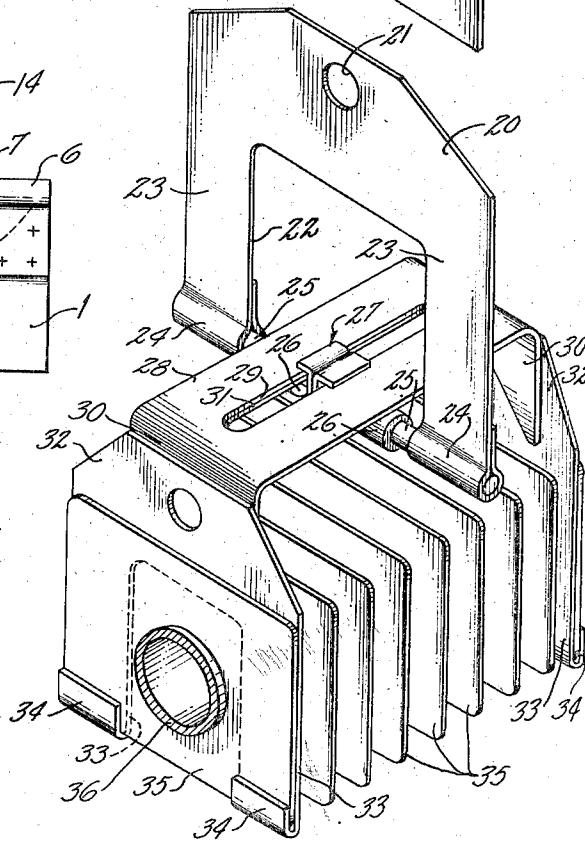
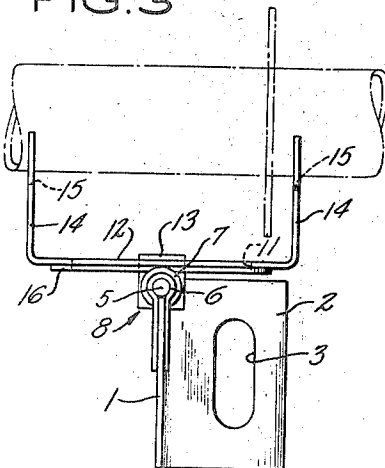


FIG. 3



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FIG. 6

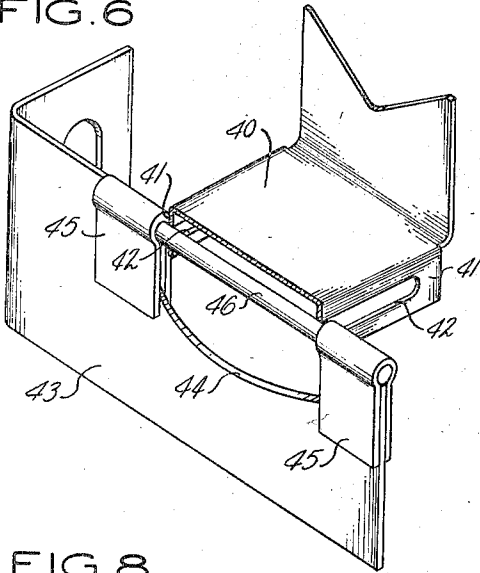


FIG. 7

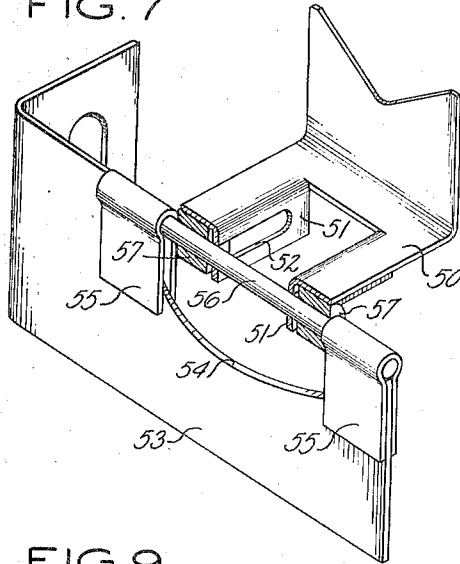


FIG. 8

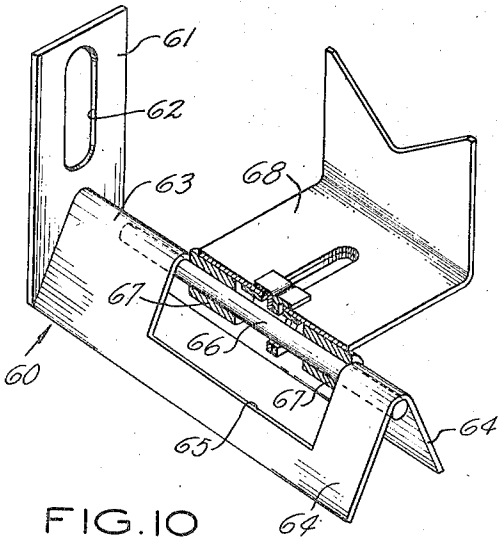


FIG. 9

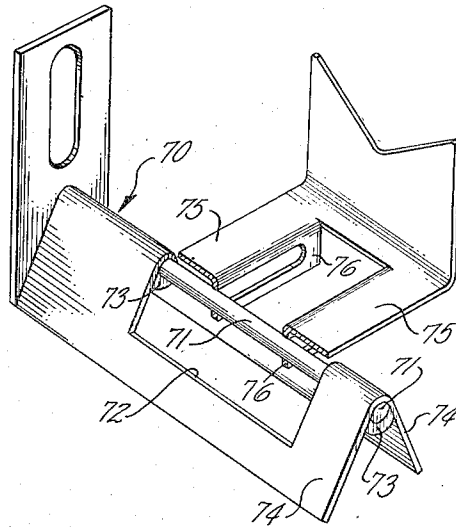


FIG. 10

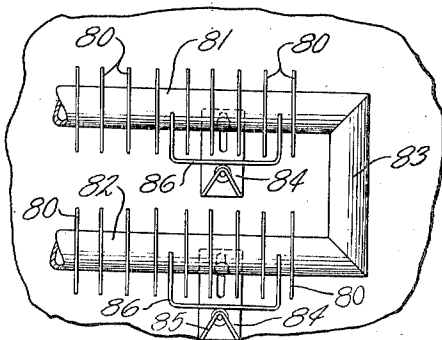
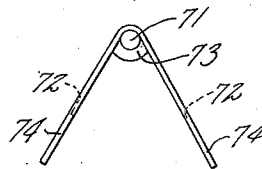


FIG. 11



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BRACKET FOR FINNED RADIATOR TUBES

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Application February 15, 1952, Serial No. 271,713

8 Claims. (Cl. 248—232)

This invention relates to bracket constructions for radiator tubes of the finned type.

An object of the invention is to provide an improved construction in the type of bracket which is designed to support a finned radiator tubing at spaced locations along a wall or ceiling adjacent which the radiator element is supported.

The radiator element comprises a tube having attached thereto a plurality of closely spaced ribs or fins generally of rectangular formation and embracing the tube throughout its length. The common type of rigid bracket which has been most extensively used as a support consists of a generally vertically disposed plate, fixed as to a wall surface and projecting between two adjacent fins to support the tube in a recess formed in the upper edge of the plate. The difficulty with a simple rigid bracket is widely recognized in that insufficient clearance is provided between adjacent fins for proper lengthwise movement of the radiator element during expansion and contraction of the same. As a result the radiator unit may tend to buckle and the fins are jammed against the brackets. Furthermore in installations where a slight angle of inclination from the horizontal is necessary for drainage and efficient operation of a heating system, as in a steam system, the support afforded by ordinary brackets often results in distortion of the tubing and faulty operation of the radiator unit due to accumulation of water therein.

Several bracket constructions have been proposed to enable support of such radiator elements and to eliminate these undesirable conditions. Examples may be seen in Tolan Patent No. 2,501,147 of 1950 and Downs Patent No. 2,578,993 of 1951. The principal difficulty of prior brackets may be found in the comparative accuracy required in initial installation to prevent later misalignment and faulty operation. It is a principal object of this invention to provide a bracket having a construction which can be installed by a comparatively unskilled or casual workman and yet operate satisfactorily under all conditions.

According to the new bracket construction a finned tube structure is supported as usual at various points along the wall or ceiling from which it is mounted. The new bracket generally comprises a wall or ceiling support having an edge portion and a horizontally disposed cradle frame transversely pivoted at said edge. The cradle is adapted for rolling endwise travel across said edge in any position to which it may be pivoted with respect to the support and with the endwise movement of the radiator element when expanding or contracting.

It is another object of the invention to take advantage of said pivotal action between the support member which is attached to the supporting surface and the cradle member which directly carries the radiator elements and in such a way as to enable speedy installation of the radiator tubing.

It is a still further object of the invention to provide a universal type of connection between the cradle and support whereby satisfactory operation is easily obtained under all conditions.

Thus the new bracket will provide a cradle member freely movable on its support and in a construction

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which will maintain such free movement within wide limits of relative adjustment with respect to the support member.

The above and other objects and advantages of the invention will be apparent from the following disclosure of the same as shown by the accompanying drawings, in which:

Fig. 1 is a top plan view of a bracket as mounted against a wall surface;

Fig. 2 is a side view of the bracket of Fig. 1;

Fig. 3 is an end view of the same;

Fig. 4 is a perspective view with portions cut away of the bracket of Fig. 1;

Fig. 5 is a perspective view of a bracket as used for supporting a finned tube element adjacent a ceiling surface.

Figs. 6 and 7 are perspective views showing modifications of the bracket construction;

Figs. 8 and 9 are views showing still further modifications;

Fig. 10 is an elevational view showing a two tier arrangement of the finned tube element supported by brackets as illustrated by Fig. 8; and

Fig. 11 is an end view of Fig. 9.

Referring to the drawings, Figs. 1—4 inclusive, an embodiment of the invention is shown with a supporting plate member 1 with a flange 2 having a slot at 3 for attachment as by a bolt 3' to a wall surface 2'. Slot 3 is elongated to permit the mounting of the bracket support at an approximate location on the wall and the later vertical or rotative adjustment of the same for a proper positioning of the bracket and correct alignment of the radiator structure.

Support plate 1 as will readily be seen is adapted for mounting in a generally vertical planar relation on the wall and is provided with an arcuate recess at 4 (Fig. 2) in an upper supporting edge portion thereof. Bridging the recess in offset relation to the plate edge is a shaft 5 held at each end along the edge by straps 6 fixed as by spot welding to the plate 1 adjacent each end of the recess. Rotatably mounted on shaft 5 is a pair of spaced rollers 7, each roller being inwardly adjacent a strap 6. Between rollers 7 and also rotatably journaled on pin 5 is a T-shaped connector link plate 8, herein shown as formed by two angle iron pieces spot welded back to back to provide the leg 10 of the T in which an opening 9 is cut to receive the shaft 5.

The link extends upwardly through an elongated slot 11 of a base plate 12 of a cradle frame and the divergent arms or ears 13 of the link overlap opposite marginal edges of the slot 11 for engagement of cradle base plate which rides on the rollers 7 of shaft 5.

The cradle is U shaped (Fig. 3) with an upstanding flange 14 at each end thereof, the upper edge of the flanges being cut in a V as at 15. The flanges extend between adjacent fins and receive the tube of the radiator element in nested relation. The bracket thus provides a yoked support of the fin tube as shown by Fig. 3, and the lower edges of the fins are spaced slightly from plate 12 for clearance of the ears 13 of the keeper link.

Plate 12 is thus movable transversely of the support member across its supporting edge on the rollers 7. Bearing surfaces in contact with the rollers are defined along each underside of plate 12 by the outer edge thereof and a spacer plate 16 which extends along the marginal edges of the elongated slot 11. It is to be noted that plate 12 may be rocked about the axis of the rollers 7 for substantially 180° and engage either side of plate 1. Whatever the angle of rotation of plate 12 with respect to the axis of the shaft 5 the bearing contact on the rollers is preserved. This is of particular advantage in the event the structure of a wall surface inter-

feres in any way with the direct placement of the flange 2 against the same in the full line position of Fig. 3. Plate 1 as in Fig. 3 may be swung either to the right or left and the base engage either face of the plate. Accordingly, the point of attachment of the bracket to the wall can be changed, if necessary, within relatively wide limits to provide support for the tubing at the desired location. It will also be apparent from Figs. 1, 2, and 4 that the yoked support of plate 12 may be shifted laterally and in addition provide for an angular displacement in the plane of plate 12, so as to readily compensate for any shifting in the position of a radiator tube. As best shown by Fig. 2 the width of slot 11 is preferably approximately twice that of the thickness of leg 10. Further the spacer plates 16 are respectively spaced from the adjacent straps 6 a distance somewhat greater than the axial length of the rollers. Thus a "shucking" movement of the holder member is permitted relative to the support plate 1. The degree of pivotal rotation of plate 12 around the link on an axis at right angles to the axis of the shaft 5 is indicated by the limit lines *a* and *b* of Fig. 1. As there shown the length of the link is not substantially greater than the width of the slot 11 and permits a relatively large movement.

As shown by the perspective view of Fig. 5 features of the new construction may be embodied in a bracket useful for suspending the finned radiator tube elements as at a ceiling height. In this embodiment the vertically disposed support plate 20 is provided with a centrally disposed opening 21 at the top thereof for hanging the plate 20 on a suitable hook, hanger rod, or other suspension member. The plate is provided with a central rectangularly shaped recess 22 providing spaced leg portions 23 at the lower ends of which are formed reversely rolled straps 24 and in which are fixed opposite ends of a pin 25. On pin 25 are journaled rollers 26 and a T-shaped connector link 27 corresponding respectively to the rollers 7 and link 8 on pin 5 in the form of Figs. 1-4. In this embodiment, however, the plate 28 longitudinally slotted at 29, has depending flanged ends 30 by which the finned radiator element is held for suspension. The marginal portions of the slot 29 on the underside of plate 28 as in Fig. 5 are provided with spacers as indicated at 31 corresponding to the marginal raised edges 16 of Fig. 4.

Fixed to the depending flanges 30 as by welding are hanger plates 32 which are of the same conformation as plate 20 with the exception that the lower ends of the legs 33 are provided with reversely bent lips as at 34 to form spaced slots for the reception of one of the fins 35 of the radiator tube 36. The finned radiator tube element is thus held as in the previously described embodiment at relatively closely spaced points of the tubing, such points of bracket support being on opposite sides of the support plate 20 and maintaining the horizontal position of the cradle on the roller bearing elements.

It may be noted that the plates 28 and 12 are both cut with the same V-shaped end flanges 14 and 30 and that the plates 20 and 32 are formed with similar large rectangular recesses. This coincidence is intended to simplify the manufacture of the various parts in duplicating the initial forming operations required in making them.

In Fig. 6 a modification of the connecting structure between the supporting edge of the bracket plate and the cradle base is shown. In this form a cradle 40 is provided with spaced depending flanges 41 along its edges and with the flanges having elongated slots 42. In the plate 43 a recess 44 is cut in the upper edge with straps 45 holding a shaft 46 bridging the recess. Preferably shaft 46 is journaled in the straps so as to roll on the edge when plate 40 is moved across the edge of plate 43.

In Fig. 7 a cradle 50 has portions cut centrally thereof to provide centrally spaced depending flanges 51 in which are provided the elongated slots 52. Plate 53 with recess 54 and straps 55 has a shaft 56 fixed along the upper edge in the straps. Rollers 57 are journaled on the shaft and held in spaced relation adjacent the straps by flanges 51.

In Fig. 8 the bracket support 60 is provided with a flat flange member 61 for placement against a wall surface with an elongated slot 62 cut therein for an adjustable mounting. Welded to the lower portion of the flange 61 is an inverted V-shaped support member 63, the sides 64 as shown being approximately at right angles to each other. Member 63 is cut away in each downwardly angled side and along the apex of the V to form a central recess at 65. The recess along the supporting edge is bridged by shaft 66 spot welded at each end in the angle of the V. Rollers 67 are journaled on the shaft and cradle 68 is connected in the assembly by a link 69 engaging a slot in member 63 as previously described in connection with the form of Figs. 1-4.

In Fig. 9 a support 70 similar to that of Fig. 8 is shown with a shaft 71 bridging a recessed portion 72. Shaft 71 is journaled at each end in the angle of the member on a bearing formed with an arcuate portion 73 of a roller welded between the sides 74. An end view is shown by Fig. 11. With the shaft rotatable on the supporting edge cradle 75 is provided with slotted depending centrally spaced flanges 76.

It will be noted that the inverted V shaped supporting member of Figs. 8, 9, and 11 is particularly useful where a limited spacing is available as in the example of a double tier arrangement of radiator elements as shown by Fig. 10. The adjacent ends of the fins 80 of the upper tube 81 and lower tube 82 (joined by elbow connector 83) are in an actual embodiment but one and three quarters inches apart. The slotted flange 84 holds the support member 85 upright with the cradle 86 embracing the tube. As shown there is sufficient clearance for manipulating the elements into place, the overall height of the inverted V and rollers on the shaft being approximately five-eighths of an inch. It is possible to install the form of Figs. 1 to 4 or of Figs. 6 and 7 with a support member plate which is of somewhat more than two inches in height. This is done by placing the plate 1, for example, in a substantially horizontal position when supporting the upper tube 81 of Fig. 10 so that no interference is had with the fins of the lower tube. Because of the centered support, however, and the neater appearance of the inverted V-shaped member I prefer this form of the bracket.

The new bracket as herein disclosed permits a free linear expansion and contraction of the finned tubing during heating and cooling of the same as will be obvious. The cradles engage the radiator element at closely spaced points thereon and at opposite sides of the shaft which may either revolve itself or carry rollers journaled on it for rolling support of the cradle on an edge of the support member. The cradle glides back and forth across the edge of the support plate member without damaging or distorting the fins of the tubing. Any tendency of the tubing to become distorted is thus eliminated and it will readily be seen that the supporting edges of a series of brackets can be arranged to provide for any degree of inclination of the tubing without impairing in any way the rolling action of the cradles. The installation requires no precision fitting.

It will be realized that various changes and modifications within the spirit and scope of the invention may readily be made in the particular embodiments thereof as herein described and it is intended in the appended claims to cover all such changes and modifications.

What I claim is:

1. A bracket for fin type radiator tube elements comprising a support member having a supporting edge with

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a recessed portion at said edge, a cradle member of U shape having a flat planar base with the arms thereof provided with means to engage a radiator element at spaced points and said base thereof having a central longitudinally extended slotted portion, said base extending transversely of said edge and mounted for pivotal movement into engagement with either face of said support member, pivotal connector means engaging the slot of said cradle base and including a shaft mounted in bridging relation across the recess on said supporting edge with rollers journaled on said shaft for endwise travel of said base across said edge in any position of pivotal movement of the cradle, said connector means supporting said cradle base for limited pivotal movement in the plane of the base on an axis positioned along the longitudinal center line thereof.

2. A bracket for fin type radiator tube elements comprising a support member having a supporting edge with a recessed portion at said edge, a cradle member of U shape with a flat planar base having depending flanged portions provided with longitudinally extended slots, said base being pivoted transversely relative to said edge for movement into engagement with either face of said support member, and connector means including a shaft bridging said recess of the supporting edge transversely engaging said cradle slots for endwise travel of said base across said edge in any position of pivotal movement of said cradle and supporting said cradle base at each lateral side portion thereof.

3. A bracket for fin type radiator tube elements comprising a support member having a plate and a flange at one end for attachment to a wall surface, said plate having a supporting edge, a cradle member of U shape with a flat planar base having depending flanged portions provided with slots extending longitudinally thereof, said base being pivoted transversely of said edge at the top of said recess for movement into engagement with either side of said support plate, and connector means including a shaft bridging the recess and journaled on the supporting edge of said plate and extending transversely through the slots of said flanged portions for endwise travel of said base across said edge in any position of pivotal movement of said cradle, said shaft supporting said base at each lateral side portion thereof.

4. A bracket for fin type radiator tube elements comprising a support member of inverted V shape in cross section having at one end thereof an upright flange provided with a vertically elongated slot for attachment to a wall surface and having along the apex of said V a supporting edge with downwardly angled sides, the apex and adjacent side portions of said member being cut away to provide a recessed portion, a cradle member having upstanding ends and a flat planar base provided with a longitudinally extended slotted portion with said base being pivoted transversely of said edge for movement into engagement with either side of said support member, and connector means engaging the slot of the cradle base including a shaft on said support member extending along the apex of the V from end to end of said recessed portion and supporting said base at each lateral side portion of said base for endwise travel across said supporting edge in any position of pivotal movement of the cradle.

5. A bracket for fin type radiator tube elements comprising a support member of inverted V shape in cross section having at one end thereof an upright flange provided with a vertically elongated slot for attachment to a wall surface and having along the apex of said V a supporting edge with downwardly angled sides, the apex and adjacent side portions of said member being cut away to provide a recessed portion, a cradle member of U shape with a flat planar base having depending flanges adjacent the lateral sides of said base and provided with longitudinally extended slots and said base being pivoted transversely of said edge for movement into engagement with either side of said support member, and connector

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means including a shaft transversely engaging the slots of said cradle base and having its ends journaled for rolling movement in said support member at opposite ends of said recessed portion, said cradle base being supported for endwise travel on said shaft across said support edge in any position of pivotal movement of the cradle.

6. A bracket for fin type radiator tube elements comprising a support member having a supporting edge with a recess at said edge, a cradle member transversely disposed to said edge and of U shape with arms to engage a finned tube element and a flat planar base section, the latter being provided with a longitudinally extended slot centrally of said base, a shaft mounted on said edge of the supporting member bridging said recess and having spaced rollers journaled on said shaft engaging the undersides of said cradle base at each side of said slot, a connector link journaled on said shaft between the rollers and projecting through said cradle slot, said link having divergently angled outer ends engageable against the marginal edges of the slot at the upper side of said base, said cradle being pivotally movable to and from substantially flat engagement against either face of said supporting edge and transversely movable across said edge in any position of pivotal travel.

7. A bracket for fin type radiator tube elements comprising a support member having a supporting edge with a recess at said edge, a U shaped cradle member transversely disposed thereto for pivotal action against either face of said edge and having a flat planar base with a centrally disposed longitudinally extending slot, a shaft mounted along said edge bridging the recess thereof on said support member and having adjacent each end of said shaft a roller journaled thereon, said rollers transversely engaging the under surface of said cradle base at each side of said cradle slot for pivotal and slidable movement relative thereto, a T-shaped connector link plate having the leg thereof journaled on said shaft and extending upwardly through said slot with divergently angled outer ends engageable against the adjacent marginal edges of said slot, said link plate being of less thickness than the width of said slot for limited sidewise movement of said cradle and of a length not substantially greater than the width of said slot for limited pivotal movement about an axis at right angles to said shaft, the edges of said slot at the underside of the cradle base having marginal spacer strips raised from the surface thereof and limiting inward movement of said rollers towards said link.

8. A bracket for fin type radiator tube elements comprising a mounting member with a supporting edge having a recessed portion at said edge, a cradle member having a flat planar base section and at each end thereof means for engagement of a fin tube element, said cradle base section extending across the top of said recess transversely of said supporting edge and having a longitudinally slotted portion for sliding movement longitudinally of the base, and connector means slidably engaging the slotted portion of said base section including a shaft bridging said recess at the top thereof transversely of said base section, said connector means supporting said cradle base for limited pivotal movement in the plane of said base section on an axis positioned along the longitudinal center line thereof and said shaft providing an axial support transversely of said base for swinging said base section to and from abutting substantially flat planar relation adjacent each side face of said supporting edge portion.

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