Oct. 3, 1939. C. E. MEYERHOEFER 2,174,992

HEATER

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Fig. 1

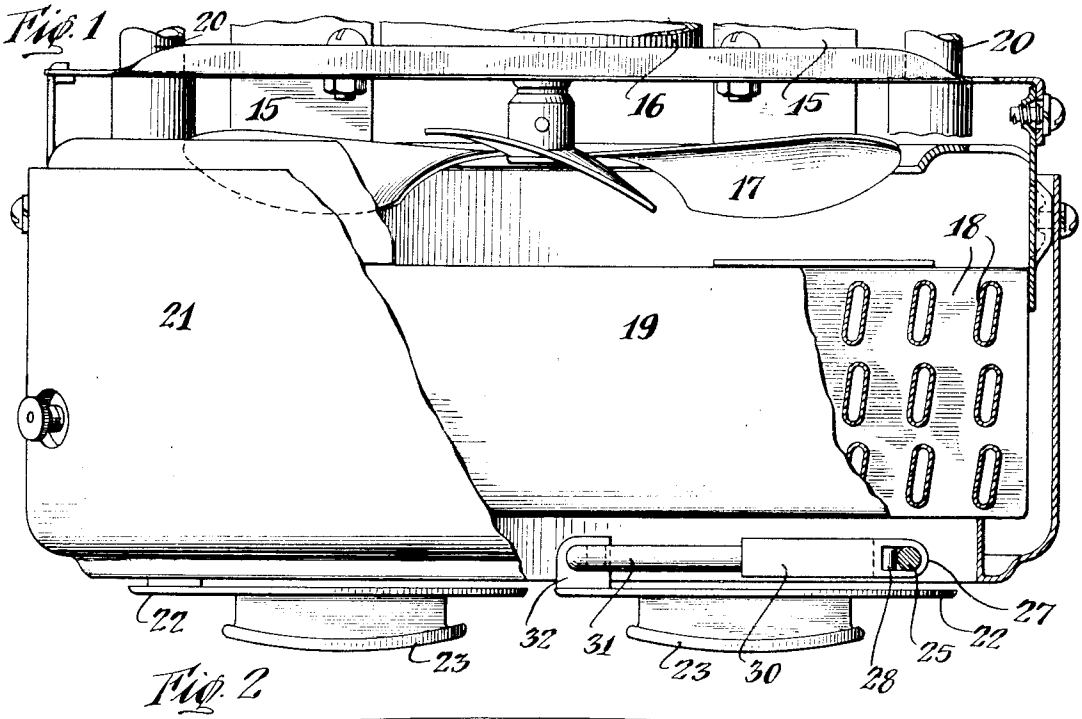
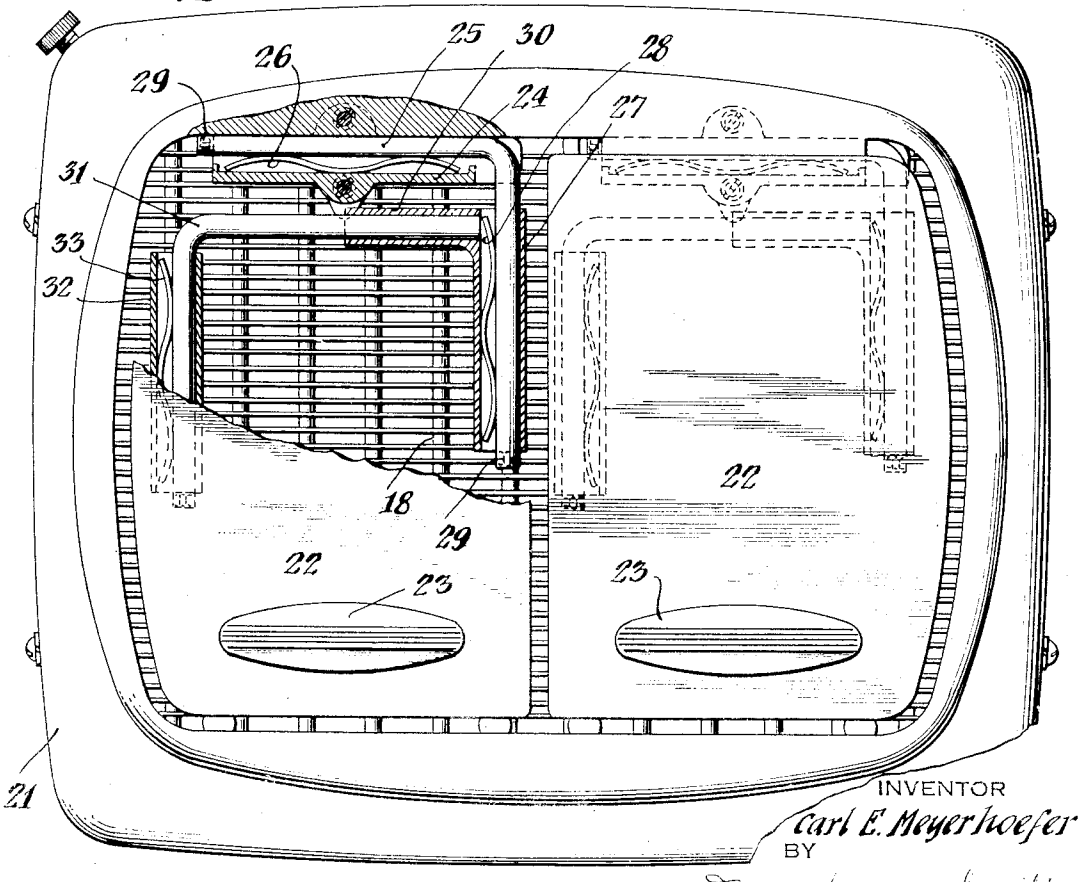


Fig. 2



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HEATER

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Fig. 3

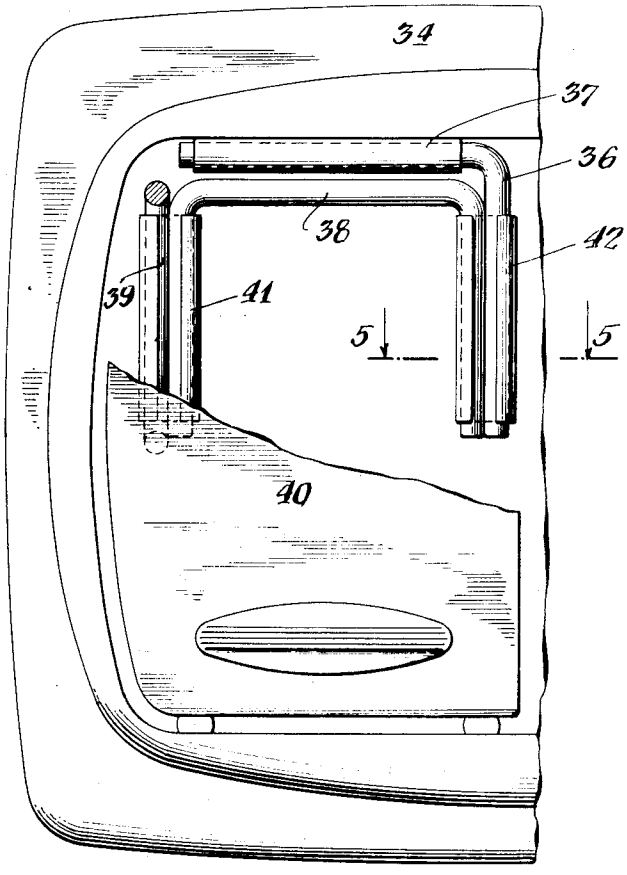


Fig. 4

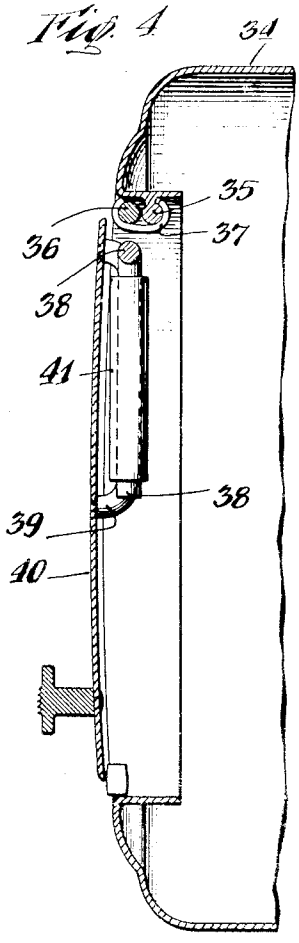


Fig. 5

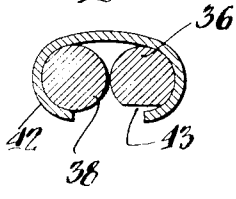


Fig. 7

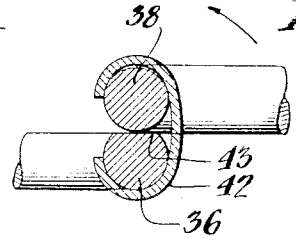


Fig. 9

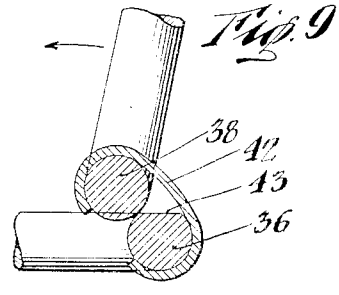


Fig. 6

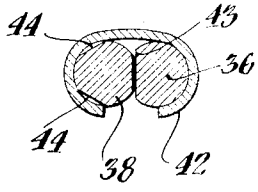
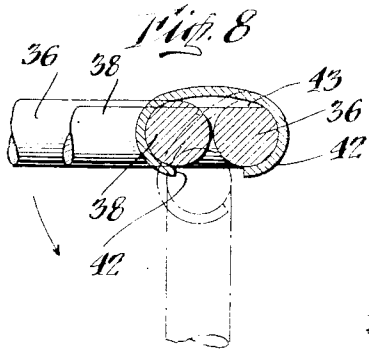


Fig. 8



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HEATER

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Fig. 11

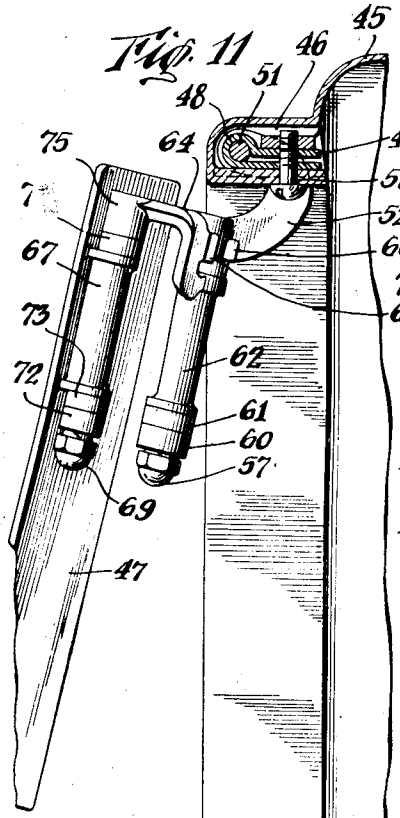


Fig. 10

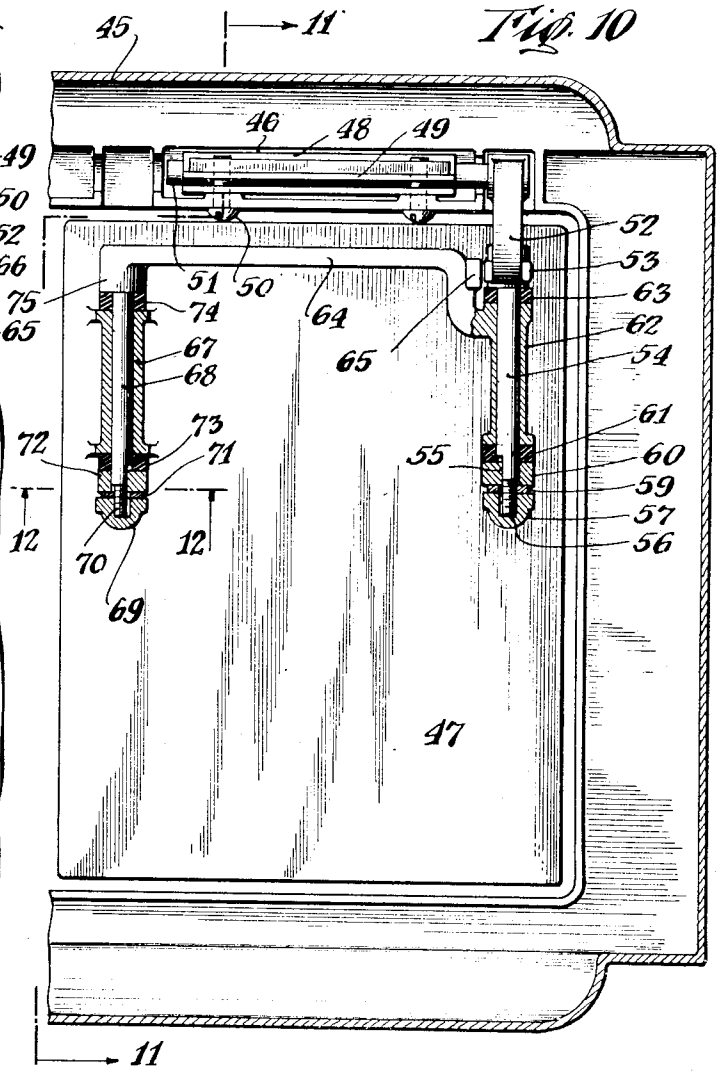


Fig. 13

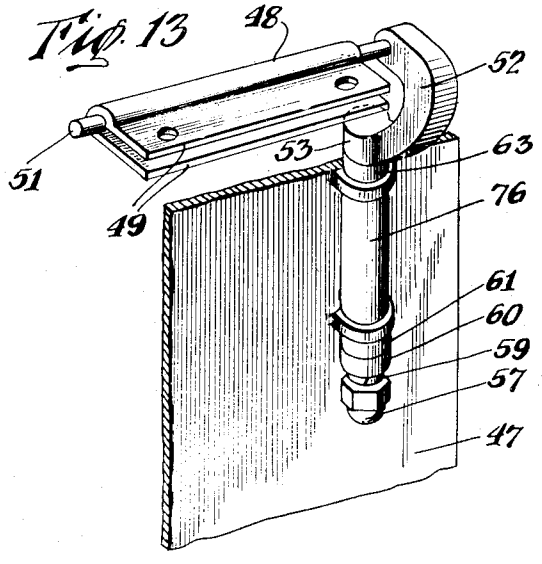
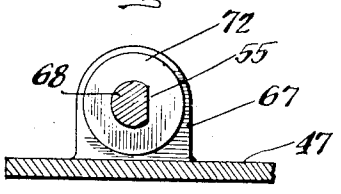


Fig. 12



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2,174,992

UNITED STATES PATENT OFFICE

2,174,992

HEATER

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Application April 15, 1936, Serial No. 74,490

8 Claims. (Cl. 98—2)

This invention relates to a structurally and functionally improved heater; the present application being a continuation in part of application for United States Letters Patent Serial No. 9,430 for Heater, filed March 5, 1935.

It is an object of the invention to furnish a heater by means of which air may be distributed in any desired direction and volume throughout an enclosed space such as the interior of a motor vehicle.

A further object of the invention is that of providing a panel mounting which will be substantially rattle proof, even when subjected to excessive vibration, and which will include a novel structure capable of ready manipulation by the casual user.

A still further object of the invention is that of furnishing a panel mounting which may be shifted to any desired position and when so shifted will maintain such position without probability of accidentally assuming a new and undesired position.

An additional object is that of providing a panel mounting embodying relatively few parts, each individually simple and rugged in construction, these parts being capable of manufacture largely by automatic machinery and being readily assembled to furnish a unitary structure operating over long periods of time with freedom from difficulties.

With these and other objects in mind, reference is had to the attached sheets of drawings illustrating practical embodiments of the invention, and in which:

Fig. 1 is a plan view of a heater with parts broken away to show underlying construction;

Fig. 2 is a front view thereof with one of the panels partially broken away to similarly show underlying construction;

Fig. 3 is a fragmentary front view of a heater embodying a panel mounting showing a slightly different construction from that shown in Figs. 1 and 2;

Fig. 4 is a sectional side view taken along the lines 4—4 and in the direction of the arrows as indicated in Fig. 3;

Fig. 5 is an enlarged sectional side view taken along the lines 5—5 and in the direction of the arrows as indicated in Fig. 3;

Fig. 6 is a view similar to Fig. 5, but showing a slightly different form of construction from that illustrated in the preceding figure;

Figs. 7, 8 and 9 are views similar to Fig. 5, but showing the parts in different positions to which they have been adjusted;

Fig. 10 is a rear view of a heater shell showing a still further form of panel mounting;

Fig. 11 is a rear view of a heater shell taken along the lines 11—11 and in the direction of the arrows as indicated in Fig. 10;

Fig. 12 is an enlarged sectional view taken along the lines 12—12 and in the direction of the arrows as indicated in Fig. 10; and

Fig. 13 is a perspective view of a still different form of mounting which may be employed.

Referring primarily to Figs. 1 and 2, it will be observed that a heater has been shown embodying the improved panel mounting of the present invention.

Thus, the reference numeral 15 indicates a bracket structure which is preferably secured to the dash and which supports a motor 16 serving to drive an air impelling member such as a fan 17. The bracket structure is suitably secured to a heater core including, for example, the conventional heat exchange structure 18 extending between heads (only one of which is indicated at 19). These heads are connected by tubes 20 or otherwise with, for example, the cooling system of an internal combustion motor. A shell 21 may enclose the core or heat exchange structure so that an artistic unit of pleasing appearance is presented and this shell may be open in line with the heat exchange structure and present panels 22 capable of being shifted, for example, by handles 23 and the mounting of which panels is the primary subject matter of the present application.

As will be observed especially in Fig. 2 the shell or parts adjacent thereto may present fixed socket portions 24 preferably corresponding in number to the number of panels employed. Extending into each of these socket portions is one leg of an L-shaped member 25. The diameter of this member is materially less than the socket portion and a relatively stiff spring 26 may be positioned within such portion to bear against the enclosed leg of the member and thus frictionally engage the same to an extent such that a deliberate twisting of the parts is necessary to secure relative movements thereof.

The second leg of the member 25 extends into a movable socket element 27 corresponding to the socket 24 and within which element a spring 28 corresponding to spring 26 is positioned. With a view to preventing accidental removal of member 25 from the sockets into which its legs extend, projections 29 may be struck out or otherwise formed in member 25, adjacent the ends thereof. It will be apparent that with the sev-

eral parts assembled these projections will strike against the end edges of the bodies of the sockets if axial shifting tends to occur, and thus limit such shifting. Element 27 may present, as an integral portion, an angularly extending socket 30 preferably of a diameter such that it snugly engages the face of one leg of an L-shaped member 31. In fact, these parts should be assembled in such manner that preferably no relative movements can occur. Secured to and integrally formed with each of the panels 22 and extending from the rear faces thereof are socket elements 32, corresponding to sockets 24 and 27, and, in common with such former structures, housing springs 33 which bear against the second arm of the L-shaped members 31.

As a consequence of this construction it will be appreciated that panels 22 may be swung outwardly by grasping handles 23 and swinging the panels around the sockets 24. If, as viewed in Fig. 2, it is desired to direct air to the left, this is accomplished by simply shifting the panels to swing around those legs of members 25 which are housed in sockets 27. If it is desired to direct air to the right as viewed in Fig. 2, this may be accomplished by simply swinging the panels around those legs of members 31 which extend within sockets 32. It will, of course, be understood that any desired combination of the foregoing movements may be had at the will of the operator. Additionally, and as indicated in dotted lines in Fig. 2, the ends of the free legs of members 31 may have projections struck from them similar to projections 29 and serving to prevent accidental detachment or withdrawal of those legs from sockets 32.

Now, referring to the construction presented in Figs. 3 and 4, it will be observed that a shell 34 has been indicated which may, for example, have as an integral part of its body, an extension 35 which may be circular in cross section. In the interest of brevity only a single panel mounting is described. However, the following structure is preferably duplicated for each panel which is employed: An L-shaped member 36 has one of its legs arranged parallel to one of the extensions 35. A U-shaped clip of relatively stiff spring stock is sprung to enclose the major portion of extension 35 and the adjacent leg of member 36. This clip has been indicated at 37. The second leg of member 36 extends downwardly and lies parallel and adjacent to one arm of a U-shaped member 38, the base of which initially extends parallel to projection 35, and the second arm of which extends downwardly and parallel to a rod 39 formed of stock similar to that of which members 36 and 38 are formed. This rod may be integral with or suitably secured to the rear face of panel 40. A clip member 41 connects the rod with the second arm of member 38 and a similar clip member 42 couples the first arm of this member with the second leg of member 36.

Both of these clip members are, of course,—similarly to member 37—formed of relatively stiff spring stock, and as indicated in Fig. 5, it will be observed that one of each adjacent pair of legs, arms, and/or projections may present a flattened face 43. In fact, as indicated in Fig. 6, one of these arms, legs, or projections may be flattened and the adjacent portion enclosed within the clip structure may present a plurality of angularly extending faces 44 connected by rounded surface portions. In this manner a stop structure is furnished which will serve to maintain, against the possibility of accidental displacement, the parts in one of any number of desired positions. In this connection it will be appreciated that the clip member, being formed of relatively stiff spring stock, will press one of the flattened faces 44 against the corresponding face 43, while at the same time it will possess sufficient resiliency to allow of the parts being swung with respect to each other.

Regardless, however, of the specific and detailed contour of the arms and legs, it will be understood that as shown in Figs. 7, 8 and 9, the parts may be swung to virtually any desired position by virtue of what might be termed the double hinged structure present at each point of pivotal connection. Incident to the length of bearing surface between these members and the springs, little if any wear will occur despite long and continued use of the parts and these parts will always remain in their adjusted positions. Obviously, as viewed in Fig. 3, the panels may be swung upwardly and outwardly, to the left and/or to the right. Consequently, air may be deflected in any desired direction within the motor vehicle or other enclosure within which the heater is positioned.

Referring to the structure shown in Figs. 10, 11, and 12, it will be observed that there has been indicated at 45 a shell which may present a recess or compartment 46, it being understood that one such compartment or recess is furnished for each panel 47 to be mounted. Positioned within the recess is a spring clip element bent to provide a rod receiving portion 48, and a pair of legs 49 extending therefrom. The spacing of these legs and the consequent constriction of the pintle receiving portion may be governed by bolt and nut assemblies 50 which also serve to secure these clip elements against displacement with respect to the heater shell. A sufficient number of assemblies are furnished to assure an even bore axis on the part of the bulged portion 48 providing the recess.

Positioned within such recess is a rod 51. This rod may be driven into or formed integral with a U-shaped arm 52. The latter extends through to one side of the compartment or recess 46 of the shell, and terminates in a headed portion 53 which is continued in the form of a bolt or rod 54. Adjacent the end of the latter a flattened surface 55 may be provided and formed in this end are screw threads 56 mounting a capping nut 57. At a point short of this nut a lock washer 59 is mounted. This bears against a collar 60 which has an opening corresponding to the cross-sectional contour of the bolt at this point, and it in turn bears against a friction washer 61 which may be formed of rubber or fibre. Interposed between this washer and head 53 and surrounding bolt 54 is a sleeve 62. A washer 63 corresponding to washer 61 is arranged between the end of sleeve 62 and head 53.

Integral with sleeve 62 is an arm 64 which extends preferably perpendicular to the axis of sleeve 62. Adjacent its inner end arm 64 may be formed with a lug 65 contactable with a projection 66 formed integrally with the head 53. In this manner a stop structure is furnished. The panel 47 has, as an integral part or otherwise secured to its rear face, a socket 67. Within this socket a rod or bolt 68 extends, this rod having, similarly to the structure described at 56 to 63, a capping nut 69 mounted by threads 70 formed adjacent the end of rod 68 and which threads are interrupted by a flattened portion mounting a lock washer 71 above which a collar

72 apertured to conform to rod 68 and a friction washer 73 are disposed. Sleeve 67 corresponds to sleeve 62 and a friction washer 74 is interposed between the upper end of this sleeve and a boss or head portion 75 formed adjacent the end of arm 64.

It will be understood that in each of the forms heretofore described, at least a three-way hinge structure is presented which allows of great latitude of adjustment of the panels with respect to the heater shells or other adjacent mounting structure. In fact, in the case of structure such as is shown in Figs. 3 to 9, each element of the hinge connection is, in effect, a double hinge structure, this affording even greater latitude of adjustment. It will also be apparent to those skilled in the art that these structures may be largely die-cast should this be desired, and thus an extremely economical and efficient form of apparatus is presented.

In certain instances a double hinge may suffice as a panel mounting. If this is the case, any of the foregoing structures may be modified in obvious manners to achieve this result. Only one such structure has been shown thus modified with a view to avoiding undue illustration. Attention is directed to Fig. 13 in which a clip element including a bulged body 48 having arms 49 is presented for mounting in a manner for example corresponding to the structure heretofore described in Figs. 10 and 11. A rod 51 is accommodated in the bore of this clip member and has a U-shaped arm 52 extending from its end. This arm also has a rod preferably integral with it and which rod corresponds to rod 54. However, instead of cooperating with a sleeve 62 this rod extends into a sleeve or socket 76 which, similarly to the corresponding element 67, is integral with or affixed to the rear face of the panel 47. Otherwise the same washer and nut assemblies are preferably employed.

It will be observed that a panel thus mounted may also be swung left or right and up or down and that this structure will thus lend itself efficiently to the distribution of air in any desired direction.

It will finally be appreciated, from a review of the foregoing, that among others the several objects of the invention as specifically aforenoted are achieved. It will, moreover, be understood that numerous changes in construction and rearrangements of the parts might be resorted to without departing from the spirit of the invention as defined by the claims.

Having described my invention, what I claim as new and desire to secure by Letters Patent is:

1. A panel mounting including a mounting, a panel, a rod having one of its ends connected to said mounting, a second rod connected to said panel and having a portion of its body disposed adjacent said first rod, a spring clip element embracing and connecting the adjacent portions of said rods and being normally of insufficient area to accommodate them whereby said element is placed in a condition of tension one of said rods presenting a flattened surface whereby said rods may be relatively rotated to be accommodated within said clip element and whereby said rods may be subsequently relatively rotated with respect to each other to cause one of them to rotate over the flattened surface of the other and to force said clip element into a condition of tension.

2. A panel mounting including in combination a mounting member, an abutment extending therefrom, an L-shaped rod having one of its arms disposed adjacent such abutment, a U-shaped rod having one of its arms disposed adjacent the second arm of such L-shaped rod, a panel, a rod shaped abutment extending from such panel and disposed adjacent the second arm of such U-shaped rod, and means for coupling said adjacent rod-arms and abutments.

3. A panel mounting including in combination a mounting member, an abutment extending therefrom, an L-shaped rod having one of its arms disposed adjacent such abutment, a U-shaped rod having one of its arms disposed adjacent the second arm of such L-shaped rod, a panel, a rod shaped abutment extending from such panel and disposed adjacent the second arm of such U-shaped rod, and spring clip members engaging adjacent rod-arms and abutments for connecting and retarding swinging movements of the same with respect to each other.

4. A panel mounting including in combination a mounting member, an L-shaped rod having one of its arms mounted for axial oscillation with respect to said member, a second rod having angularly extending arms, one arm of such latter rod being disposed adjacent the second arm of such first named rod, means for swingingly connecting such arms to each other, a panel, and means for coupling said panel to be axially oscillatable with respect to another of the arms of such second rod, certain of said rod arms being non-circular in cross-section and being in rotatable contact with an adjacent rod-arm.

5. A panel mounting including a shell formed with an opening, a panel for covering said opening, and a hinge structure connecting said panel to said shell, said structure comprising a bolt, a sleeve encircling said bolt, and stop elements connected to said sleeve and bolt respectively and extending immediately adjacent thereto to limit relative turning movements thereof.

6. A panel mounting for a heat transfer unit and which unit presents a fixed pivot member, said mounting including an L-shaped element, one of the arms of which extends parallel to said pivot member, means for rotatably mounting said arm with respect to said pivot member, the second arm of said element being free, a U-shaped member, one of the arms of said latter member being disposed parallel to and adjacent the free arm of said element, means for coupling said adjacent arms to have rotatable movements with respect to each other, a panel, a pivot member fixed with respect to said panel member, the second arm of said U-shaped member extending parallel to and adjacent said latter pivot member, and means for rotatably coupling said latter pivot member and arm.

7. A panel mounting for a heat transfer unit and which unit presents a fixed pivot member, said mounting including an L-shaped element, one of the arms of which extends parallel to said pivot member, means for rotatably mounting said arm with respect to said pivot member, the second arm of said element being free, a U-shaped member, one of the arms of said latter member being disposed parallel to and adjacent the free arm of said element, means for coupling said adjacent arms to have rotatable movements with respect to each other, a panel, a pivot member fixed with respect to said panel member, the second arm of said U-shaped member extending parallel to and adjacent said latter pivot member, means for rotatably coupling said latter pivot member and arm, and means

forming a part of said mounting and cooperating with said adjacent arms and pivot members to prevent free rotation of the latter with respect to each other.

8. A panel mounting for a heat transfer unit, which unit presents a fixed socket, said mounting including a L-shaped element, one of the arms of said element being disposed within and rotatable with respect to the socket, the other arm of said element being free, a U-shaped member, one of the arms of said member being disposed parallel to and adjacent the free arm of said element, means for coupling said adjacent arms, a panel formed with a fixed socket, the second arm of said U-shaped member being disposed within said latter socket, and means for preventing free rotation of the arms with respect to the sockets within which they are disposed.

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