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3,720,154

REGISTER STRUCTURES

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Fig. 1

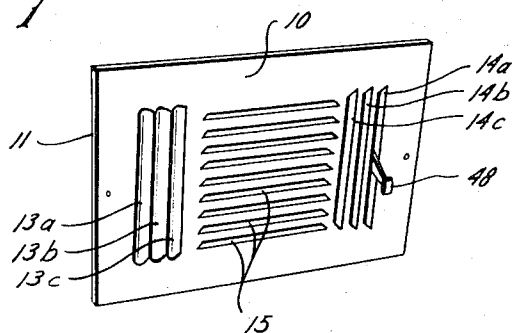


Fig. 2

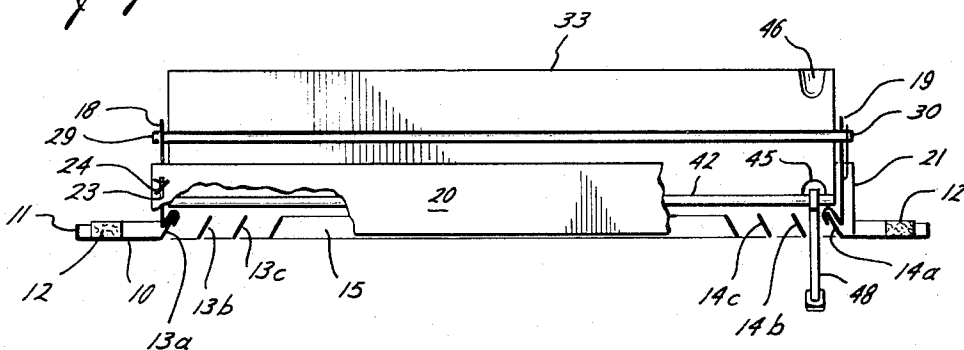
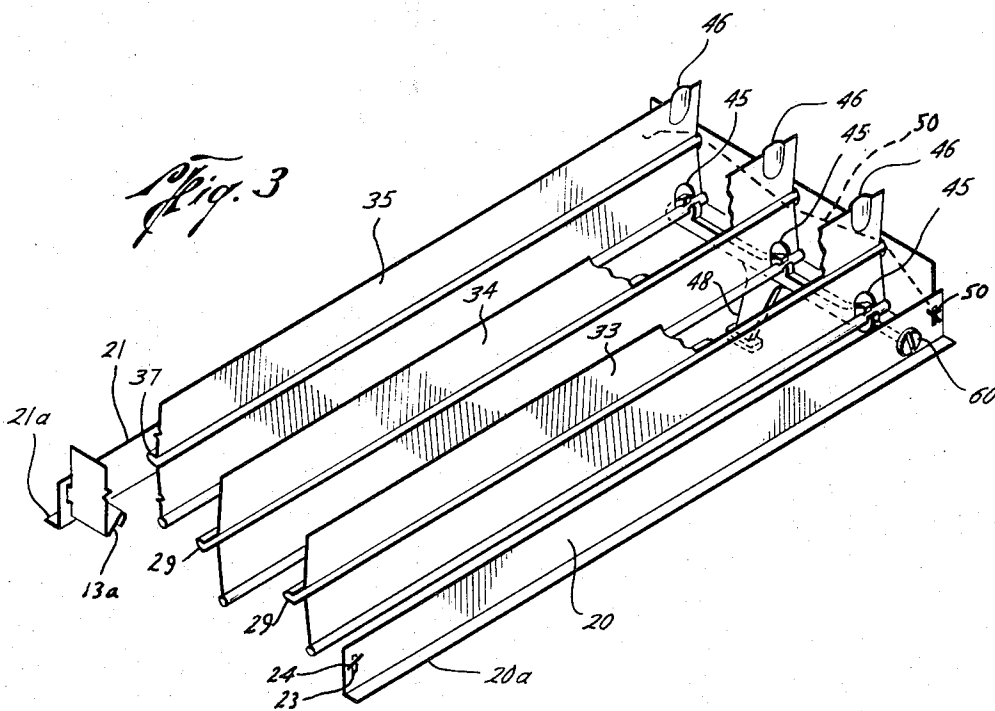


Fig. 3



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REGISTER STRUCTURES

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6 Claims

ABSTRACT OF THE DISCLOSURE

Improved register structures which are assembled without use of welds, or rivets or screws, or other similar connection devices. The face plates of the registers have oppositely directed louvers or vanes with which the frame and closure assembly are engaged. The vanes with which such assemblies are engaged are oppositely angular, and the frame parts are engaged therewith so that the parts are firmly held.

SUMMARY OF THE INVENTION

In manufacture of registers of the type used as air vent controls, it has been the practice to assemble the parts by use of welds, rivets, bolts, screws, and the like. Such operations during fabrication of the registers consume considerable time and require the use of more or less expensive machinery and tools. The registers according to the invention are assembled by providing interengageable parts which when assembled lock the parts together into a complete structure. The assembly of the registers may be accomplished rapidly, with a minimum of machinery and tools, and without the necessity for building space to house such machinery and tools. Therefore, the registers may be manufactured in optimum time, and at minimum cost, in a very efficient manner.

The registers produced in the manner herein disclosed are entirely satisfactory and dependable in use. The registers will function in the same manner as registers conventionally fabricated, and are completely trouble free and reliable in operation.

Other objects and advantages of the invention will appear from the detailed description of a preferred embodiment, the accompanying drawings being referred to during the description.

BRIEF DESCRIPTIONS OF THE DRAWINGS

FIG. 1 is a perspective view of the face plate of a register of preferred form according to the invention.

FIG. 2 is a side elevational view, partly in transverse cross section, of the register shown in FIG. 1.

FIG. 3 is a perspective view of the frame and closure assembly of the register shown in FIGS. 1 and 2, taken from the back side thereof.

DESCRIPTION OF THE PREFERRED EMBODIMENT

Referring now to the drawings in detail, the flat metal faceplate 10 of the register has a right angle narrow flange 11 completely therearound, extending rearwardly of the faceplate. When the registers are mounted for use, the flange 11 is disposed against the wall surface on which the register is disposed around a gas or air duct or conduit, and the flange engaged with the wall surface forms a seal around the outer edge of the face plate. Additional seals, such as the felt strip 12 glued to the back of the face plate, may be provided.

In the specific form of register of the preferred embodiment described, there are three sets of louvers or vanes through which air passes in leaving (or sometimes entering) the register outlet (or inlet). The face plate is rectangular, somewhat longer in one direction than the other. At each end, there is a set of three louvers

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which are parallel to a shorter side of the face plate. The louvers are formed by making cuts through the face plate and bending the louvers to the desired angle with the face plate, this construction of the louvers being conventional. The louvers at one end, indicated in the drawing as louvers 13a, 13b, 13c, are bent back from the front of the face plate at an acute angle toward the center of the face plate. At the other end of the face plate, three louvers, 14a, 14b, 14c are formed in the same fashion, louvers 14a-14c being at acute angles toward the center of the face plate, and in opposed angularity with respect to louvers 13a-13c. Between louvers 13c and 14c, there are disposed nine parallel louvers each indicated by reference numeral 15, these being equally spaced and parallel with the longer sides of the face plate. Louvers 15 are each at an acute angle with the face plate, bent backwardly from the front face thereof. Each of the louvers of each set of louvers may be bent or directed at the same or different angles as desired, in order to cause air flow directions as desired.

The frame of the register is made of four flat elongate metal strips 18, 19, 20, and 21. The shorter strips 18, 19 are disposed parallel to the opposite shorter ends of the face plate, and the longer strips 20, 21 are disposed parallel to the opposite longer sides of the face plate. Each of the end strips 18, 19 of the frame are respectively bent at one edge to an angle corresponding to the angle of a louver 12a, 14a, the angular part of the strip being return-bent around the edge and opposite side of the louver as shown in the drawings. The backwardly extending parts of strips 18, 19 are perpendicular to the plane of the face plate. The return bends of the strips 18, 19 are engaged over the louver edges to be connected thereto. The end strips 18, 19 of the frame, thus connected, are resident to outward movements parallel to the face plate. The side strips 20, 21 of the frame are slotted at their ends at 23, the slots being elongate and parallel with the end strips 18, 19. End strips 18, 19 have at each of their ends a projecting twist lug 24. The lug 24 at each end of each strip 18, 19 is received through a slot 23 at one end of each of the strips 20, 21, and twisted to be secured against removal from the slots. When connected in this manner, the strips 20, 21 hold strips 18, 19 against inward movement, and the connections to the louvers at the return bends of strips 18, 19 resist outward movement, so that the frame structure is rigid and securely held to the face plate. Each strip 20, 21 has an integral outturned flange 20a, 21a, respectively, disposed against the back of the face plate.

The end strips 18, 19 are wider than the side strips 20, 21. The back edge portions of strips 18, 19, which extend beyond the back edges of the side strips 20, 21, have plural equally spaced perforations therethrough into which the projecting opposite end lugs 29, 30 of each closure vane 33, 34, 35 are disposed. Each closure vane 33-35 is formed from a flat elongate rectangular sheet or strip of metal. Each vane has along its longitudinal center a crimped formation 37, the projecting ends of which form the lugs 29, 30 of each vane. The crimp 37 extends the full length of each vane between the lugs 29, 30. The crimps are bent and doubled so as to be strong, and provide an integral rod or shaft element which is used in supporting and reinforcing the vanes. The lug 29 at one end of each vane 33-35 is received in one of the perforations of end strip 18, and the opposite lug 30 of each vane 33-35 is received in one of the perforations of end strip 19.

The vanes 33-35 are parallel one to the other, and are of such width that when they are pivotally rotated to positions more or less parallel with the face plate, they substantially completely close the opening provided within the frame made up of strips 18-19 and 20-21.

When the vanes 33-35 are rotated to positions angular to or perpendicular to the face plate, then openings are formed therebetween through which air or gas may pass to flow through the louvers of the face plate.

Each vane 33-35 has a narrow return bent edge 42, along one of its longitudinal edges. The vanes each have an opening 45 adjacent to the return bent edge 42 at one end of the vane, the opening of the three vanes being in line transversely. Directly across each vane from its opening 45 there is an upset formation 46, depressed away from the face of the vane which is directed toward the face plate when the vanes are closed. The vanes are connected together by a handle 48 which has pivotal connection to the return bend 42 of each vane 33-35 where the return bend is disposed past the opening 45 of the vane. The handle interconnects the vane edges, spaced the same as the end projections 29 and 30 are spaced, so that movement of the handle 48 across the face of the face plate, and parallel to the directions of the louvers 13a-c and 14a-c, causes simultaneous rotation of the vanes between opened and closed positions. Movement of the handle in one direction closes the vanes simultaneously, while movement of the handle in the opposite direction opens the vanes simultaneously.

In assembling the apparatus, the face plate is connected to the end strips 18, 19 by placing the return bent edges of the strips over the edges of the louvers 13a and 14a. Next, the projections 29, 30 of vanes 33-35 are placed in the holes or perforations of strips 18, 19, the strips being resiliently forced slightly outwardly to provide for introduction of the projections into the holes. Next, the side strips 20, 21 are placed with the twist lugs 24 received through slots 23, and the lugs are twisted to secure the side strips. Finally, the handle 48 is connected to the vanes through the slot between vanes 14a and 14b.

A length of music wire 50, or other spring wire, indicated in FIG. 3 by dashed line showing, is disposed against the outer side of strip 19, and has its ends bent and received in the slots 23 of strips 20, 21, and extends over the lugs 30 of vanes 33 and 35 and under the lug 30 of vane 34. The resiliency of wire 50 holds the vane ends against vibration, and provides friction against rotation of the vanes out of the position in which they have been placed by movement of handle 48. In order that the vanes 33-35 will not be moved to too great an extent in the vane opening direction, a screw 60 is screwed into a hole in side strip 20 to extend to a position inwardly thereof to engage handle 48 and prevent over-movement in the described direction. This completes the assembly of the apparatus, as will be realized may be done very rapidly and without the use of any tools except perhaps a pair of pliers or the like for twisting the twist lugs 24.

While a preferred embodiment of the apparatus has been described and shown in the drawings, many modifications thereof may be made by a person skilled in the art without departing from the spirit of the invention, and it is intended to protect by Letters Patent all forms of the invention falling within the scope of the following claims.

I claim:

1. Register structure, comprising panel means having gas flow opening therethrough and having angular plate means extending from the surface thereof, two of said angular plate means being spaced apart and being oppositely angular with respect to the plane of said panel means, frame means comprising a first pair of opposite elements each interlocked with one of said oppositely angular plate means and a second pair of opposite elements each connected with an end of each element of said first pair of opposite elements, whereby said first and second pairs of opposite elements are assembled and locked to said panel means by the angularities of said angular plate means.

2. The combination of claim 1, said angular plate means being oppositely angular louvers for directing gas flow through two of said gas flow openings through said panel means, each element of said first pair of opposite elements comprising a flat elongate strip having an obtuse angle bend therealong disposed along the angle between a said louver and said plate means and an edge bend disposed around the edge of the louver whereby the element is restrained against angular movement away from the louver.

3. The combination of claim 2, said louvers being of divergent angularity.

4. The combination of claim 2, said panel means having additional gas flow openings therethrough and additional louvers associated therewith disposed within the frame formed by said first and second pairs of frame elements.

5. The combination of claim 4, said first and second pairs of frame elements each being substantially perpendicular to said panel means, and including projecting twist lug means at the ends of the elements of one of said first and second pairs of frame elements and slot means adjacent the ends of the elements of the other of said first and second pairs of frame elements, said lugs being inserted in said slots and twisted to form said connections between said first and second pairs of frame elements.

6. The combination of claim 5, including plural parallel rotatable vane means disposed between the elements of one said pair of frame elements, said vane means being rotatable between positions opening and closing the opening through said frame and thereby controlling gas movement through said gas flow openings of said panel means.

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