United States Patent

Shepherd

[15] **3,665,838**

[45] **May 30, 1972**

[54] AIR CHAMBER ASSEMBLY

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[73] Assignee: **Wilson Lighting Limited,** Toronto, Ontario, Canada

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[21] Appl. No.: **6,673**

[52] **U.S. Cl.** .....**98/40 DL,** 49/5, 52/317, 98/1, 240/2 V

[51] **Int. Cl.** **F24f 11/02,** F24f 13/06

[58] **Field of Search** .....49/1, 7, 5; 98/40 DL, 40 VT, 98/86, 1, 115 KH; 52/DIG. 5, 317, 218; 160/1, 5; 240/2 V; 169/2, 42

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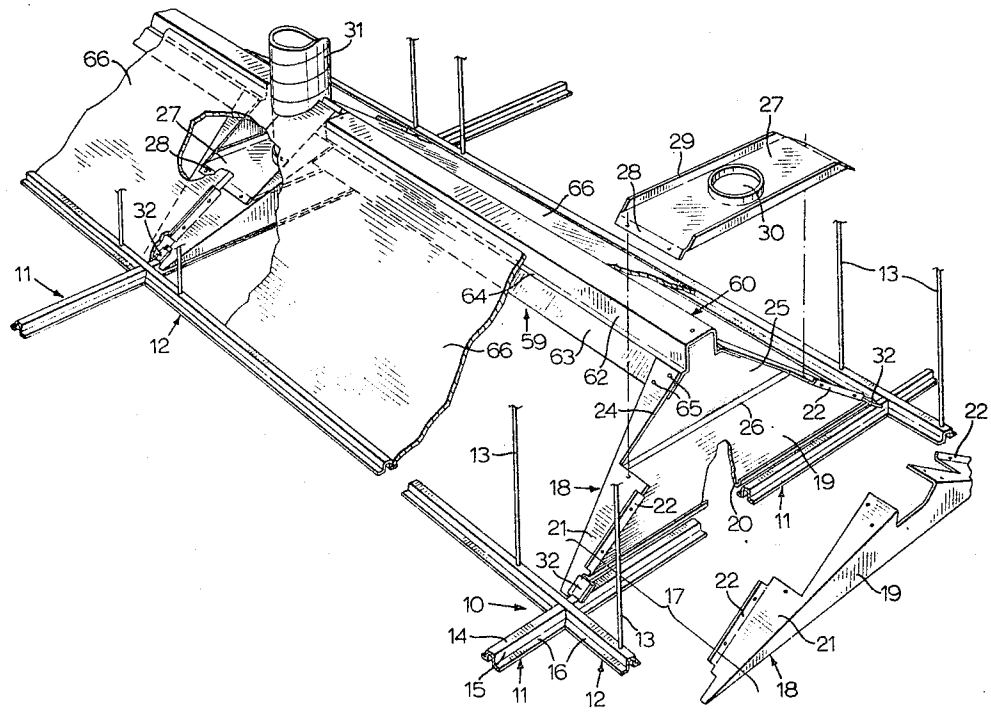
[57] **ABSTRACT**

An air chamber assembly including two adjacently disposed fluorescent lighting units mounted in the ceiling of, for example, a commercial office or school, the assembly comprising an air chamber which is located within a space between the two lighting units and which is defined by a hollow air chamber casing, or air boot. The casing is formed with a ventilation air inlet duct through which air having the desired temperature and humidity may be supplied to the interior of the casing from a suitably located source of such air within the associated building. The assembly also comprises a support beam which is of inverted channel form in cross-section and which has a web portion, depending parallel limb portions, and outwardly directed flange portions projecting from the longitudinal edges of the limb portions of the beam remote from the web portion in a plane parallel to the plane containing the web portion. In certain embodiments of the invention, heat-fusible plates, rods or bodies are disposed between the web portion or the flange portions of the beam and the air chamber casing, thereby to maintain an edge portion of the casing a pre-determined spaced distance from the beam. In an alternative embodiment of the invention, heat-fusible strips are provided, each strip being secured to a portion of the casing which is pivotally mounted relative to the remainder of the casing, and to said remainder of the casing. Movement of the pivotal portions of the casing is thus prevented except on fusion of the heat-fusible strips, the pivotal portions of the casing each having an edge which is disposed in supported contact with the beam to maintain the above-mentioned edge portion of the casing at said pre-determined distance from the beam except on pivotal movement of the pivotal portions of the casing. The pre-determined spaced distance between the above-mentioned edge portion of the casing and the beam defines a ventilation air outlet duct through which ventilation air may flow from the interior of the casing to the room space or the like below the assembly, the casing being urged under gravity in the downward direction to cause this edge portion of the casing to enter into air-tight sealing contact with the flange portions of the beam on fusion of the heat-fusible plates, rods, bodies or strips.

17 Claims, 10 Drawing Figures



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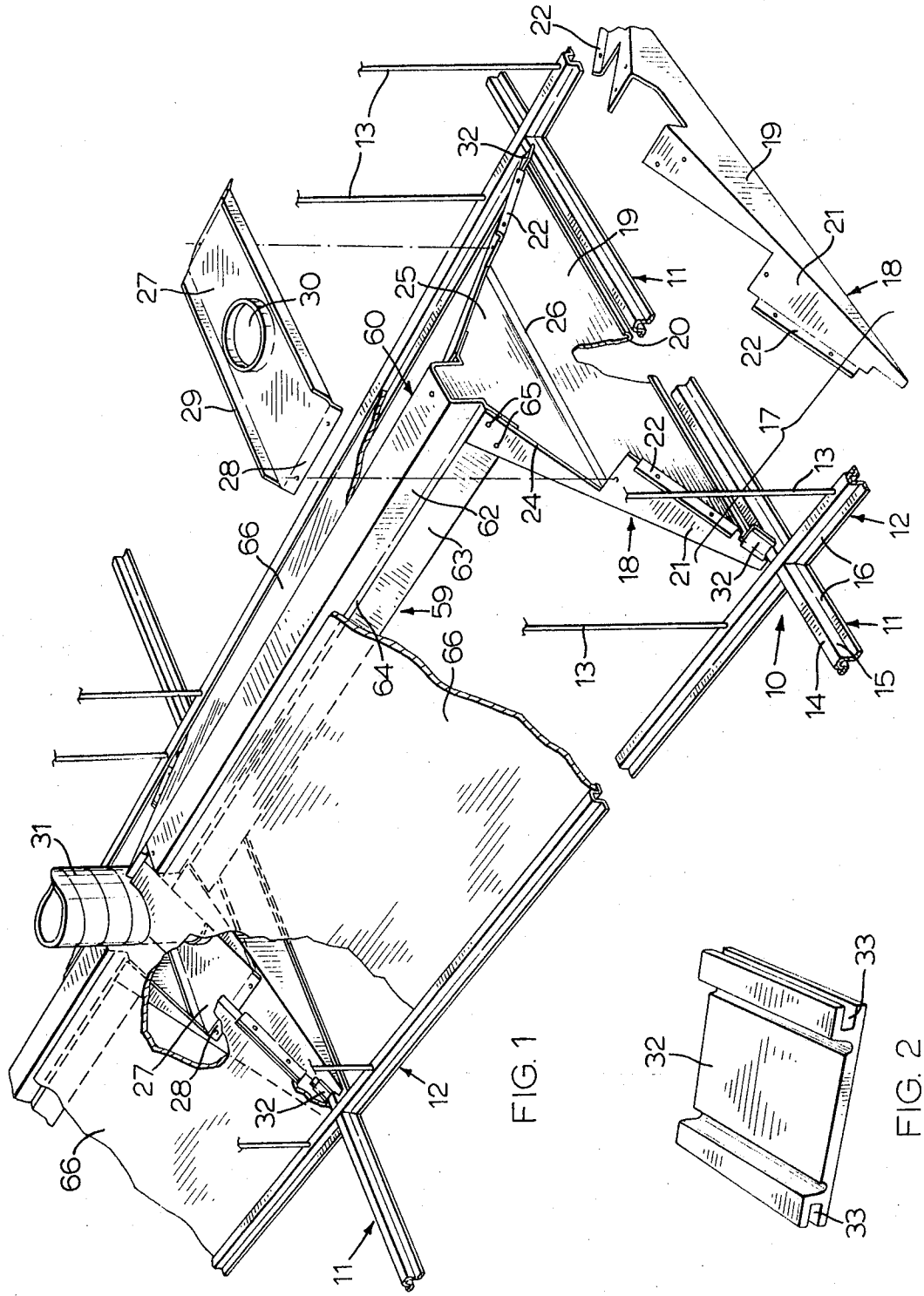

FIG. 1

FIG. 2

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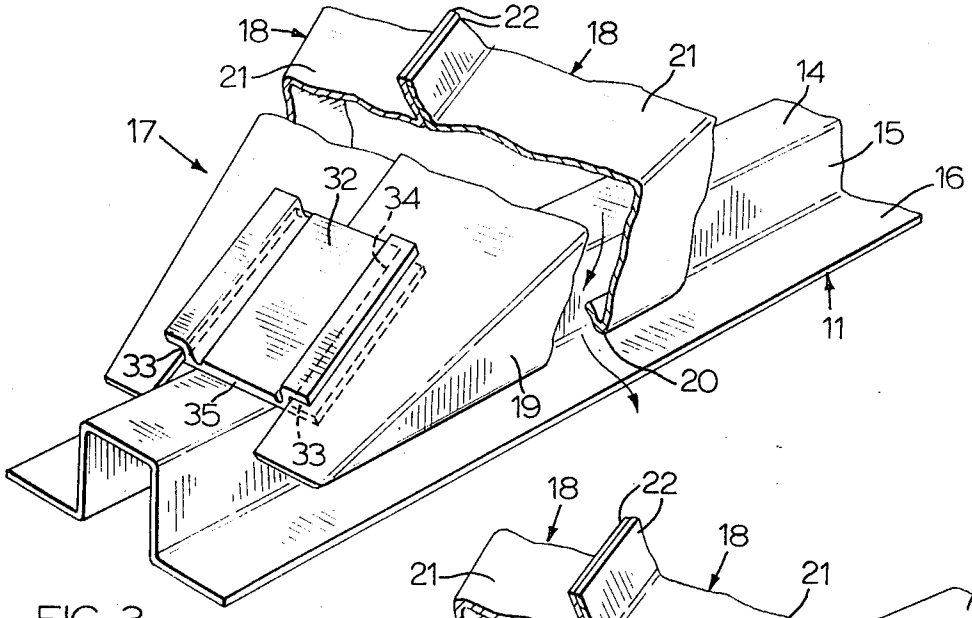

FIG. 3

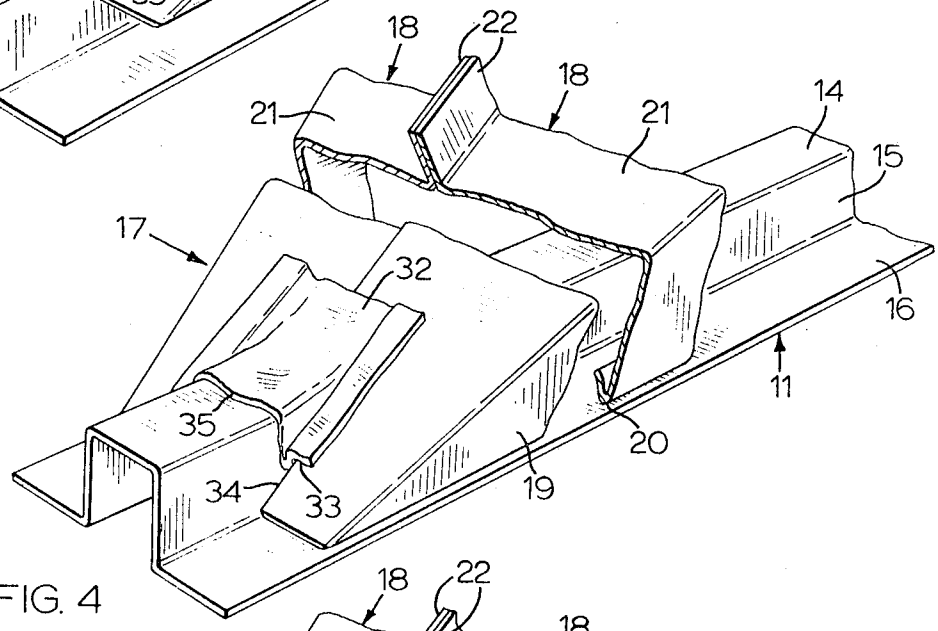

FIG. 4

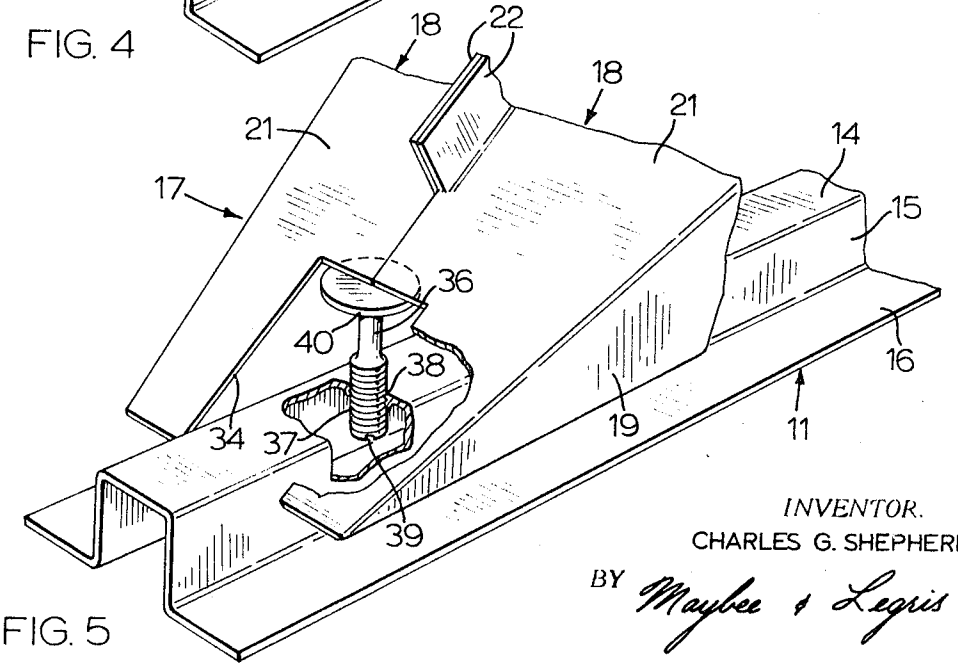

FIG. 5

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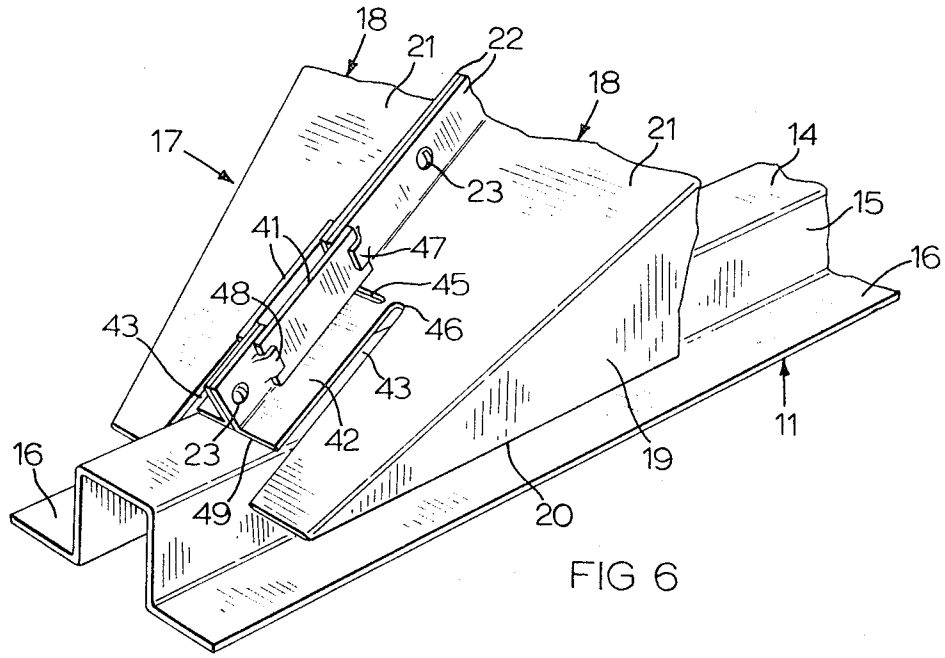

FIG 6

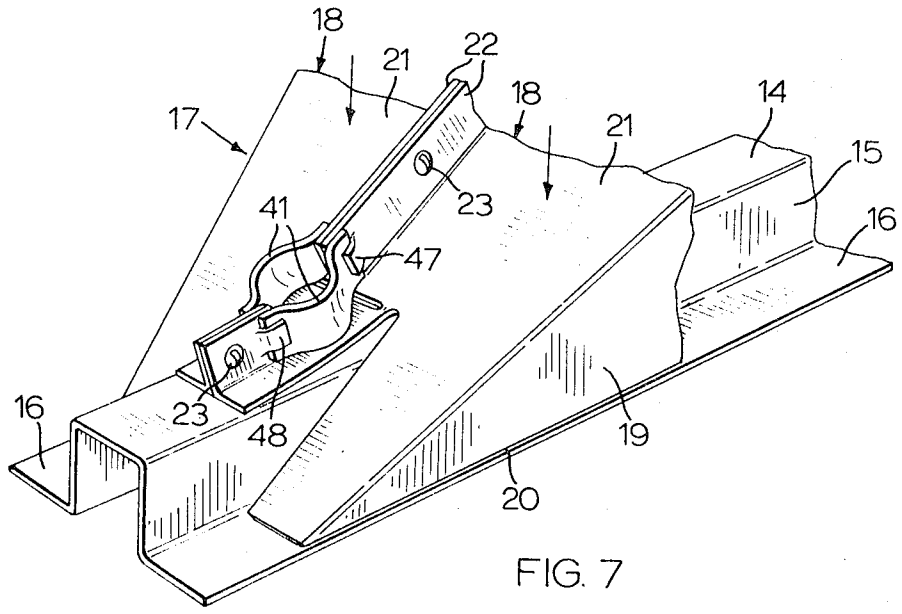

FIG. 7

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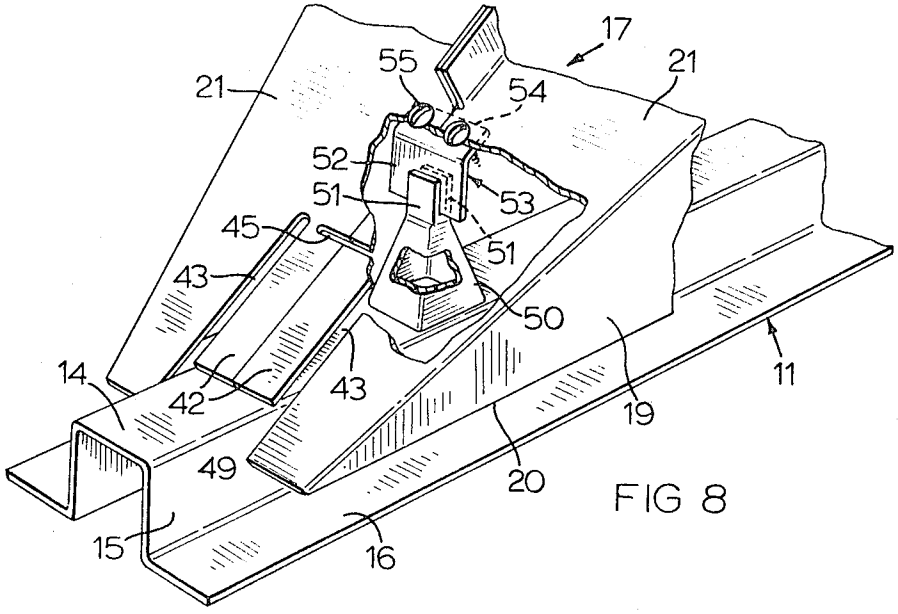

FIG 8

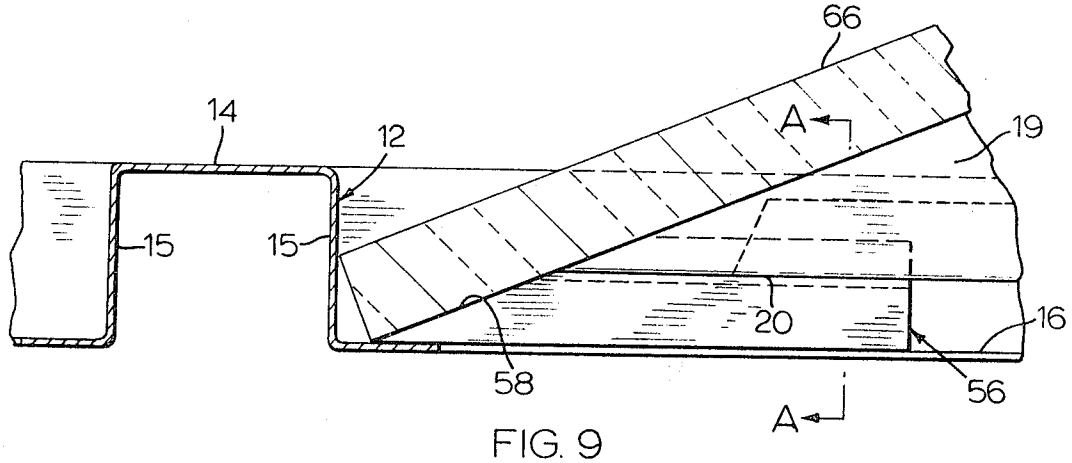

FIG. 9

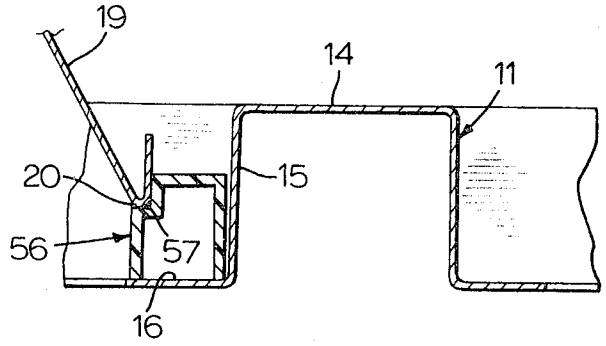

FIG. 10

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AIR CHAMBER ASSEMBLY

This invention is concerned with an air chamber assembly which includes a hollow air chamber casing to which ventilation air may operatively be supplied from a convenient source thereof, and from which the ventilation air may, in turn, be supplied to the room space or the like disposed below the assembly, the air chamber defined by the casing being particularly, although not exclusively, intended to be disposed between adjacent lighting units in the ceiling of a building, such as a commercial office or school.

It is a disadvantage of such an assembly that if a fire should occur in the room space or the like below the assembly the fire may rapidly spread to other room spaces or the like within the building, such spreading of the fire occuring through the ventilation air outlet from the air chamber, the ventilation air inlet to the chamber and the ducting which connects the ventilation air inlets of the various air chamber assemblies within the building to the source of ventilation air. Clearly, it is desirable to ensure that, if a fire should occur within a room space or the like in a building, the fire is isolated within the room space or the like in question and does not spread to the remaining room spaces or the like in the building. With the view to achieving this desirable result, it has hitherto been proposed to provide the ventilation air outlet from each air chamber with a valve mechanism, such as a butterfly type valve, which automatically closes when the temperature within the room space below the assembly rises to a pre-determined value, but while such valve mechanisms have operated reasonably satisfactorily they are relatively complex and expensive and, for this reason, their use has only been on a very limited scale.

Fairly simple arrangements by means of which an opening or duct may be closed when the temperature to which the arrangement are subjected rises to a pre-determined value, the passage of fire through the opening or duct thereby being prevented, are known. The most relevant such arrangements of which the inventor is aware are those disclosed in U.S. Pat. Nos. 997,481 which issued on July 11, 1911 to G. Walker et al.; 2,580,540 which issued on Jan. 1, 1952 to C.R. Graves and 3,341,971 which issued on Sept. 19, 1967 to G.F. Hartman, Jr. Thus, in the constructions disclosed in these patents the openings or ducts through which fire could pass are operatively closed by the fire proof doors **5** of Walker, the slab **20** of Graves or the damper blades **24** of Hartman, Jr., the operation of these members being initiated by the melting of a heat-fusible element or elements.

It will be noted, however, that these members which operatively serve to close the openings or ducts in the constructions disclosed in the above-numbered patents serve no purpose until the heat-fusible element or elements melt. Thus, the members in question are, of course, entirely redundant except when a fire occurs, or when the temperature to which the arrangements are subjected otherwise rises to a predetermined value.

It is a primary object of the present invention to provide an improved form of air chamber assembly in which the ventilation air outlet duct is automatically closed when a fire occurs in the room space or the like below the assembly, and in which the member for closing the ventilation air outlet duct serves, under normal operating conditions, to define an edge of the ventilation air outlet duct, the member accordingly having a functional purpose both when the assembly is in a normal condition of operation and when the assembly is subjected to fire heat.

An air chamber assembly according to one aspect of the present invention comprises means defining a hollow air chamber casing, a first air flow duct formed in the casing for the passage of ventilation air to or from the interior of the casing, a support member, and spacer means which comprises heat-fusible means and which is so disposed in supporting relation between the air chamber casing and the support member that an edge portion of the casing is substantially maintained at a pre-determined spaced distance from the support member. This pre-determined spaced distance defines a second air flow duct between said edge portion of the air chamber casing and the support member, which communicates with a space to be ventilated for the passage of ventilation air between the interior of the air chamber casing, the casing and said space being urged under the influence of gravity acting on the casing in the direction to cause said edge portion thereof to enter into substratially air-tight sealing contact with the support member on fusion of the heat-fusible means.

In certain embodiments of the invention, the spacer means consists of the heat-fusible means, while in other embodiments of the invention the spacer means consists of both the heat-fusible means and a rigid plate which is pivotally mounted on the casing and which is preferably constituted by a portion of the casing pivotally connected to the remainder of the casing, the pivotal plate presenting an edge which is disposed in supported contact with the support member, and the heat-fusible means being secured to the pivotal plate and to the remainder of the casing to prevent pivotal movement of the pivotal plate except on fusion of the heat-fusible means.

In order that the invention may be more clearly understood and more readily carried into effect the same will now, by way of example, be more fully described with reference to the accompanying drawings in which FIG. **1** is a perspective view from above showing elements of a pair of air chamber assemblies according to a first embodiment of the invention, the assemblies including adjacently disposed lighting units, the parts of elements of the assemblies being broken away for clarity;

FIG. **2** is a perspective view on an enlarged scale of one of the heat-fusible spacer means illustrated in FIG. **1**;

FIG. **3** is a view, similar to FIG. **1** but on an enlarged scale, of part of one of the air chamber assemblies illustrated in FIG. **1**;

FIG. **4** is a view corresponding to FIG. **3**, but showing a different operative condition of the assembly illustrated therein;

FIG. **5** is a view corresponding to FIG. **3**, but showing a second embodiment of the invention;

FIG. **6** is a view, corresponding to FIG. **3**, but showing a third embodiment of the invention;

FIG. **7** is a view corresponding to FIG. **4**, but showing the third embodiment of the invention;

FIG. **8** is a view corresponding to FIG. **3**, but showing a fourth embodiment of the invention;

FIG. **9** is a sectional end view of a fifth embodiment of the invention; and

FIG. **10** is a sectional view on the line A—A in FIG. **9**.

Throughout the views of the drawings, like reference numerals are used to denote like parts.

Referring to the drawings and in particular to FIG. **1** thereof, **10** denotes generally a support structure comprising a plurality of interconnected support members each of which is constituted by a support beam **11** or **12**, the beams **11, 12** being suspended by means of tie members **13** from, for example, a flooring support deck (not shown). The beams **11** and **12** are each of inverted channel form in cross-section, and have a web portion **14**, depending substantially parallel limb portions **15**, and outwardly directed flange portions **16** projecting from the longitudinal edges of the limb portions **15** remote from the web portion **14** in a plane substantially parallel to the plane containing the web portion **14**.

The support structure constituted by the beams **11, 12** is preferably, but not necessarily, in the form of one of the support structures disclosed in my co-pending application, Ser. No. 874,138 filed on Nov. 6, 1969.

17 denotes generally each of a plurality of means defining hollow air chamber casings, each casing **17** comprising two end walls **18** which are substantially identical and each of which consists of an end wall portion **19** outwardly inclined in an upward direction from a lower edge portion **20** thereof, and side flange portions **21** which project inwardly from the end wall portion **19**.

The side flange portions **21** of each end wall **18** have inner edges constituted by upstanding ribs **22** which are secured, in a substantially air-tight manner, to the upstanding ribs **22** of

the side flange portions 21 of the other end wall 18 of each casing 17 by means, for example, of bolts 23 shown in FIGS. 6 and 7.

The edges constituted by the upstanding ribs 22 of the side flange portions 21 of each end wall 18 are disposed in a substantially vertical plane, so that the side flange portions 21 are of progressively increasing breadth in an upward direction, the side flange portions 21 of each end wall 18 being of notched form, as indicated by the reference numeral 24, at the upper portions thereof remote from the end wall portion 19. A substantially vertical closure plate 25 is secured to the side flange portions 21 of each end wall 18 at the notched portion 24 thereof, the lower edge 26 of the plate 25 being secured in a substantially air-tight manner to the end wall portion 19. Furthermore, in each casing 17, a substantially horizontal closure plate 27 is secured, in a substantially air-tight manner, partially to the side flange portion 21, at the notched portions 24 thereof, of each end wall 18, and partially to the side flange portions 21, at the notched portions 24 thereof, of the other end wall 18 of the casing 17. These substantially air-tight securements between the plate 27 and the side wall flanges 21 are effected between downwardly inclined end portion 28 of the plate 27 and the side flange portions 21. Each plate 27 also presents upstanding lateral flange portions 29 which are disposed in substantially air-tight abutting contact with the plates 25 of the pair of end walls 18 comprising each casing 17.

The space between the pair of end walls 18 comprising each casing 17, i.e. the space which is bounded by the plate 27 and the lower parts of the end wall portions 19 and the side flange portions 21 of the two end walls 18, constitutes an air chamber.

A first air flow duct is formed in each air chamber casing 17 for the passage of ventilation air to or from the interior of the casing 17, this duct, in the embodiment of the invention illustrated in FIG. 1, being constituted by an opening 30 formed in the plate 27. Ducting 31 may be operatively connected to the opening 30 in the plates 27, the ducting 31 serving to convey air having the desired temperature and humidity to the appropriate air chambers from a convenience source (not shown) thereof. In any particular installation, if certain of the air chambers are not required the closure plates 27 bounding the air chambers may be omitted, in which case these chambers serve as air return passages.

Spacer means comprising heat-fusible means is disposed in supporting relation between each air chamber casing 17 and the appropriate one of the support beams 11 thereby to maintain an edge portion of the casing 17, which edge portion is constituted by the edge portions 20 of the end walls 18 of the casing 17, a predetermined spaced distance above the flange portions 16 of the support beam 11, said pre-determined spaced distance defining a second air flow duct between said edge portion of the casing 17 and the support beam 11, which communicates with a space to be ventilated for the passage of ventilation air between the interior of the air chamber casing and said space. Except in the case hereinbefore referred to in which the air chambers serve as air return passages, the first air flow duct constituted by the opening 30 in the plate 27 of each casing 17 constitutes, of course, a ventilation air inlet duct to the interior of the casing 17 and the second air flow duct constitutes a ventilation air outlet duct from the interior of the casing 17.

With particular reference to the first embodiment of the invention illustrated in FIGS. 1 to 4, the spacer means consists of a pair of spaced plates 32 of heat-fusible material, the opposed side edges of each plate 32 being provided with grooves 33. The side flange portions 21 of each end wall 18 of the casing 17 are notched at the lower portions thereof remote from the end wall portion 19, the edges of each side flange portion 21 of one of the end walls 18 and the edges of the adjacent side flange portion 21 of the other of the end walls 18, which edges define said notched portions in the two side flange portions 21, together bounding a recess 34 within which the appropriate plate 32 is located with lateral portions of said edges disposed within the grooves 33 in said plate 32. The lower edge 35 of each plate 32 bears directly on and is in supported contact with the upper face of the web portion 14 of the beam 11. Each plate 32 also bears directly on the casing 17.

The edge portion of the air chamber casing 17 constituted by the edge portions 20 of the end walls 18 is thus maintained said pre-determined distance above the outwardly directed flange portions 16 of the beam 11 by means of the plates 32, the air chamber casing 17 being, however, urged, by being permitted to descend under the influence of gravity acting thereon, in the direction to cause entry of the web and limb portions 14 and 15, respectively, of the beam 11 into the recesses 34, with resultant entry of the edge portion of the air chamber casing 17 which is constituted by the edge portions 20 of the end walls 18 into substantially air-tight sealing contact with the flange portions 16 of the beam 11, on fusion of the plates 32.

As will be appreciated, the two plates 32 are disposed in the manner hereinbefore described on opposite sides of the air chamber casing 17.

The second embodiment of the invention illustrated in FIG. 5 differs from that described above with reference to FIGS. 1 to 4 in that the heat-fusible spacer means is constituted, not by the plates 32, but by a pair of rods 36 of heat-fusible material, one end portion 37 of each rod 36 being mounted in engagement with the associated beam 11 by being disposed in screw-threaded engagement through an aperture 38 formed in the web portion 14 of the beam 11. The lower end of each rod 36 is preferably slotted as shown at 39 in FIG. 5 thereby to permit the rod 35 to be rotated relative to the beam 11, by means, for example, of a screw driver engaged with the slot 39. In this manner, the magnitude of the predetermined distance between the edge portion of the air chamber casing 17 constituted by the edge portions 20 of the end walls 18 and the flange portions 16 of the beam 11 may be adjusted, the upper end 40 of each rod 36 being provided with a support disc which is in supporting engagement with the air chamber casing 17.

While, in the second embodiment of the invention as described above with reference to FIG. 5 of the drawings, there is, in each air chamber assembly a pair of rods 36, it will be understood that, by disposing the rod 36 substantially centrally of the assembly, a single rod 36 may be used.

Referring now to the third embodiment of the invention illustrated in FIGS. 6 and 7, the spacer means comprises, in addition to heat-fusible means which in this embodiment is constituted by strips 41 of heat-fusible material, a rigid plate 42 which is pivotally mounted on the casing 17 and which is constituted by a portion of the casing 17 bounded by two slots 43, and end 44 of each of which communicates with an edge of the casing 17, and by a third slot 45 which terminates adjacent to the other ends 46 of the slots 43. The third slot 45 constitutes the pivotal axis of the portion 42 relative to the remainder of the air chamber casing 17. The heat-fusible strips 41 are secured to the pivotal portion 42 and to the remaining portion of the air chamber casing 17 to prevent pivotal movement of the portion 42 relative to the remaining portion of the casing 17, except on fusion of the heat-fusible means, each strip 41 preferably being so secured by being mounted with one end thereof disposed in secured engagement with a tooth 47 which is lanced from one of the upstanding ribs 22 presented by said remaining portion of the air chamber casing 17 and the other end of said strip 41 being similarly engaged by a similarly formed tooth 48 presented by a portion of the above-mentioned upstanding rib 22 which projects from the pivotal portion 42 of the casing 17. The second strip 41 is similarly secured relative to the portions of the other upstanding rib 22, the ribs 22 being, of course, discontinuous for a pre-determined distance in the region of the third slot 45 thereby to permit pivotal movement of the portion 42 relative to the remaining portion of the casing 17, in the manner indicated in FIG. 7, when the strips 41 are fused

by being subjected to a temperature in excess of a pre-determined value. Such pivotal movement of the portion **42** results in the edge portion of the air chamber casing **17** which is constituted by the edge portions **20** of the end walls **18** descending into substantially air-tight contact with the flange portions **16** of the beam **11** as illustrated in FIG. **7**, said edge portion of the casing **17** normally being maintained the pre-determined distance from the flange portions **16** of the beam **11** by the supporting contact between the web portion **14** of the beam **11** and the lower edges **49** of the pivotal portions **42**.

With reference to the embodiment of the invention illustrated in FIG. **8**, this embodiment differs from that illustrated in FIGS. **1** to **4** in that instead of the plates **32** there is provided a pair of spaced hollow bodies **50** which are preferably of trapezoidal form in cross-section, the lower surface of each body **50** being in supported contact with the web portion **14** of the associated beam **11**, and the upper surface of each body **50** presenting two spaced, parallel flanges **51** within which one limb **52** of a substantially L-shaped metal bracket member **53**, the other limb **54** of which is secured as by bolts **55** to the air chamber casing **17**, is disposed. As in the case of the embodiment illustrated in FIGS. **6** and **7**, the fourth embodiment illustrated in FIG. **8** incorporates rigid plates **42** each of which is pivotally mounted on the casing **17**, and preferably comprises a portion of the casing **17** bounded by slots **43** and **45**, the portions **42** presenting lower edges **49** disposed substantially in contact with the web portion **14** of the beam **11**, and being pivotally mounted relative to the remaining portion of the air chamber casing **17** thereby, on fusion of the bodies **50**, to permit the edge portion of the casing **17** which is constituted by the edge portions **20** of the end walls **18** to descend under gravity into substantially air-tight contact with the flange portions **16** of the beam **11**.

While, in the fourth embodiment of the invention as described above with reference to FIG. **8** of the drawings, there is, in each air chamber assembly a pair of bodies **50**, it will be understood that by disposing the body **50** substantially centrally of the assembly, a single body **50** may be used. Finally, the fifth embodiment of the invention illustrated in FIGS. **9** and **10**, differs from the first embodiment described above with reference to FIGS. **1** to **4** merely in that the heat-fusible spacer means comprises a pair of spaced, hollow bodies **56** which are disposed between the flange portions **16** of the associated beam **11** and the edge portions **20** of the end walls **18** of the casing **17** thereby to maintain the edge portion of the casing **17** which is constituted by said edge portions **20** said pre-determined distance from the flange portions **16** of the beam **11**. Each of the bodies **56** is provided with a longitudinally extending notch **57** within which the edge portion **20** of the associated end wall **18** of the casing **17** is disposed as shown in FIG. **10**, the bodies **56** being disposed at the ends of the ventilation air outlet slot and being partially of tapered form as shown at **58** thereby to ensure that the ventilation air outlet slot is of substantially rectangular form. In this manner, difficulties which may arise in ensuring that the desired air flow pattern through the ventilation air outlet slots are achieved, these difficulties resulting from the tapered form of the end portions of the slots, are substantially overcome. In the third embodiment of the invention shown in FIGS. **6** and **7** of the drawings, the lower edge portions of the strips **41** are in tension, and the upper edge portions of the strips **41** are in compression. Referring to the remaining embodiments of the invention as hereinbefore described with reference to the drawings, it will be noted that the heat-fusible means constituted by the plates **32** of the embodiment shown in FIG. **1** to **4**, the rods **36** of the embodiment shown in FIG. **5**, the bodies **50** of the embodiment shown in FIG. **8**, and the bodies **56** of the embodiment shown in FIGS. **9** and **10** are under compression and are not under tensile stressing, the heat-fusible means constituted by, for example, the plates **32** shown in FIG. **1** being, however, also under shear stressing.

With particular reference again to FIG. **1** of the drawings, **59** denotes generally each of two lighting unit structures, only the forward portion of the rear lighting unit structure **59** being illustrated.

The lighting unit structure **59** are substantially identical and each comprises spaced end walls one of which is constituted by one of the end walls **18** of one of the air chamber casings **17** and the other of which is constituted by one of the end walls **18** of the adjacent air chamber casing **17**. Each lighting unit structure **59** also comprises a member **60** which constitutes part of a lighting element and which has a web portion **61**, a pair of opposed, parallel limb portions **62** and a pair of outwardly inclined flange portions **63**, the portions **63** being connected to the limb portions **62** through ledges **64**.

A closure plate (not shown) is secured to the undersides of the ledges **64** of each member **60**, a lamp (not shown), which is preferably in the form of a fluorescent lighting lamp, being mounted on the underside of the closure plate. The closure plate and the lamp constitute further parts of the above-mentioned lighting element. The space bounded by the web and limb portions **61**, **62** of each member **60** and by the associated closure plate operatively contains the ballast and other auziliary circuit elements of the lighting element. These circuit elements may be of conventional form. A translucent lens (not shown) is mounted on each member **60** and is operatively retained in position by means of inwardly directed edge portions of the inclined flange portions **63**, each end portion of the translucent lens being disposed through a correspondingly formed opening in the end wall portion **19** of the appropriate end wall **18** with the lens mounted on the lower edge **26** of the plate **25** which is secured to said end wall portion **19**.

In each structure **59** the member **60** rigidly interconnects the associated end walls **18** by means, for example, of bolts **65** between the inclined flange portions **63** of the member **60** and the side flange portions **21** of the end walls **18**.

Heat insulation panels **66** are each mounted with the lower edge portions thereof in supported engagement with the appropriate flange portion **16** of one of the beams **12** and with the upper edge portion thereof in supported engagement with the appropriate inclined flange portion **63** of the member **60** of the appropriate structure **59**. The lower faces of the panels **66** are preferably formed of a light reflecting material thereby to reflect the light from the fluorescent lighting lamp of the associated lighting element into the room space of the like disposed therebelow.

The purpose of the notched portions **24** in the side flange portions **21** of the end walls **18**, and of the associated closure plates **25** and **27**, is to permit increased flexibility in the manner in which air chamber assemblies and the lighting unit structures **59** may be used. Thus, for example, where it is desired to use air chamber assemblies and the structures **59** in such a manner that the members **60** of the structures **59** are disposed substantially at right angles to horizontal beams or girders, such as girders supporting the ceiling, and where it is required that the level of the upper faces of the members **60** be above the lower faces of these beams or girders, the beams or girders, and disposed through the spaces bounded by the plates **25** and **27** of the air chamber casings **17**. Where beams or girders are so disposed it is not, of course, possible for the associated air chambers to be used, or if they are to be used alternative arrangements (not shown) to that constituted by the opening **30** in the plate **27** will be required for supplying the air to the chambers. It is to be emphasized that the above-described manner of using the air chamber assemblies and the lighting unit structures **59** in which beams or girders are disposed through the spaces bounded by the plates **25** and **27** of the casings **17** is merely one example of the ways in which the assemblies and structures **59** may be used where the notched portions **24** in the side flange portions **21** of the end walls **18**, or notched portions of different forms, are provided.

Furthermore, it is, of course, to be understood that where notched portions in the side flange portions **21** of each end wall **18** are not required, such as where the above problem resulting from the presence of horizontal beams or girders does not arise, the notched portions **24** in the side flange por-

tions 21 of each end wall 18, and the associated closure plates 25 and 27, may be omitted, and that these are not, therefore, essential features of the invention.

While as described above with reference to FIG. 1 the end walls 18 of each air chamber casing 17 each also constitutes an end wall of one of the lighting unit structures 59, as in the case of the invention forming the subject of my co-pending application, Ser. No. 874,140 filed on Nov. 6, 1969, it is to be understood that in the present invention the air chamber casing 17 may be quite separate and distinct from any lighting unit structures between which the casing 17 is operatively disposed.

The present invention thus provides an air chamber assembly in which the pre-determined space between the edge portion of the casing 17 constituted by the edge portions 20 of the end walls 18, and the flange portions 16 of the associated beam 11 is automatically closed when a fire occurs in the room space or the like below the assembly, the end flange portions 19 of the end walls 18 which close this space serving, of course, to define an edge of the space under normal operating conditions. The end flange portions 19 accordingly have a functional purpose both when the assembly is in a normal condition of operation and when the assembly is subjected to fire heat.

What I claim as my invention is:

1. Air chamber assembly comprising means defining a hollow air chamber casing, a first air flow duct formed in the casing for the passage of ventilation air to or from the interior of the casing, a support member, and spacer means which comprises heat-fusible means and which is disposed in supporting relation between the air chamber casing and the support member thereby to maintain an edge portion of the air chamber casing a pre-determined spaced distance from the support member, said pre-determined spaced distance defining a second air flow duct therebetween communicating with a space to be ventilated for the passage of ventilation air between the interior of the air chamber casing and said space, and the casing being urged under the influence of gravity acting on the casing in the direction to cause said edge portion thereof to enter into substantially air-tight sealing contact with the support member on fusion of the heat-fusible means.

2. Air chamber assembly comprising means defining a hollow air chamber casing, a first air flow duct formed in the casing for the passage of ventilation air to or from the interior of the casing, a support member, and spacer means which consists of heat-fusible means disposed in supporting relation between the support member and the air chamber casing with the heat-fusible means bearing directly on the support member and on the air chamber casing, thereby to maintain an edge portion of the air chamber casing a predetermined spaced distance from the support member, said predetermined spaced distance defining a second air flow duct therebetween communicating with a space to be ventilated for the passage of ventilation air between the interior of the air chamber casing and said space, and the casing being urged in the direction to cause said edge portion thereof to enter into substantially air-tight sealing contact with the support member of fusion of the heat-fusible means.

3. Air chamber assembly according to claim 2, wherein the support member comprises a beam of inverted channel form in cross-section, the beam having a web portion, depending substantially parallel limb portions, and outwardly directed flange portions projecting from the longitudinal edges of the limb portions of the beam remote from the web portion in a plane substantially parallel to the plane containing the web portion; and the heat-fusible means comprises a pair of spaced plates of heat-fusible material, the opposed side edges of each of which are grooved with the lateral edge portions of the casing bounding a recess formed therein disposed within the grooves, the lower edge of each plate being in supported contact with the upper face of the web portion of the beam thereby to maintain said edge portion of the air chamber casing said pre-determined distance above the outwardly directed flange portions of the beam, while permitting the air chamber casing to descent under gravity with resultant entry of the web and limb portions of the beam into the recesses formed in the casing and entry of said edge portion of the casing into substantially air-tight sealing contact with the flange portions of the beam, on fusion of the plates.

4. Air chamber assembly according to claim 1, wherein the heat-fusible means comprises at least one rod of heat-fusible material, one end portion of the rod being mounted in engagement with the support member and the other end of the rod supporting the air chamber casing.

5. Air chamber assembly according to claim 4, wherein said one end portion of the heat-fusible rod is in screw-threaded engagement with an aperture formed in the support member, thereby permitting variation in the magnitude of said predetermined distance between said edge portion of the air chamber casing and the support member.

6. Air chamber assembly according to claim 1, including two adjacently disposed lighting unit structures each of which comprises spaced end walls and a member which rigidly interconnects the end walls and which is adapted to support at least one lamp, each end wall including an end wall portion and said flange portions which project from the inner wall portion, and which present edges, and the adjacent end walls of the two adjacently disposed lighting unit structures together constituting the air chamber casing, with the edges of the side flange portions of said adjacent end walls being secured together in a substantially air-tight manner.

7. Air chamber assembly according to claim 1, wherein the heat-fusible means comprises a body the upper surface of which presents two spaced, parallel flanges, a bracket member presented by the air chamber casing being disposed between said spaced, parallel flanges in supported contact with the body.

8. Air chamber assembly according to claim 7, wherein a rigid plate is pivotally mounted on the air chamber casing, said pivotal plate presenting an edge which is disposed substantially in contact with the web portion of the support beam.

9. Air chamber assembly according to claim 8, wherein the pivotal plate is constituted by a portion of the air chamber casing bounded by two slots, one end of each of which communicates with an edge of the casing, and by a third slot which terminates adjacent to the other ends of said two slots, the third slot constituting the axis about which the pivotal plate may move relative to the casing.

10. Air chamber assembly according to claim 1, wherein the spacer means further comprises a rigid plate which is pivotally mounted on the air chamber casing, said pivotal plate presenting an edge which is disposed in supported contact with the support member thereby to maintain said edge portion of the casing said pre-determined distance from the support member and the heat-fusible means being secured to the pivotal plate and to the casing to prevent pivotal movement of the pivotal plate relative to the casing except on fusion of the heat-fusible means.

11. Air chamber assembly according to claim 10, wherein the pivotal plate is constituted by a portion of the air chamber casing bounded by two slots one end of each of which communicates with an edge of the casing, and by a third slot which terminates adjacent to the other ends of said two slots, the third slot constituting the axis about which the pivotal plate may move relative to the casing.

12. Air chamber assembly comprising a hollow air chamber casing, a first air flow duct formed in the casing for the passage of ventilation air to or from the interior of the casing, a support beam of inverted channel form in cross-section, the beam having a web portion, depending substantially parallel limb portions, and outwardly directed flange portions projecting from the longitudinal edges of the limb portions of the beam remote from the web portion in a plane substantially parallel to the plane containing the web portion, and heat-fusible spacer means disposed between the web portion of the support beam and the air chamber casing thereby to maintain an

edge portion of the air chamber casing a pre-determined spaced distance from the flange portions of the support beam, said pre-determined spaced distance constituting a second air flow duct for the passage of ventilation air from or to, respectively, the interior of the air chamber casing, and the casing being urged under gravity in the downward direction to cause said edge portion thereof to enter into substantially air-tight sealing contact with the flange portions of the support beam on fusion of the spacer means.

13. Air chamber assembly according to claim **12**, wherein the spacer means comprises a hollow body the upper surface of which presents two spaced, parallel flanges, a bracket member presented by the air chamber casing being disposed between said spaced, parallel flanges in supported contact with the hollow body.

14. Air chamber assembly according to claim **12**, wherein a rigid plate is pivotally mounted mounted on the air chamber casing, said pivotal plate presenting an edge which is disposed substantially in contact with the web portion of the support beam.

15. Air chamber assembly according to claim **14**, wherein the pivotal plate is constituted by a portion of the air chamber casing bounded by two slots, one end of each of which communicates with an edge of the casing, and by a third slot which terminates adjacent to the other ends of said two slots, the third slot constituting the axis about which the pivotal plate may move relative to the casing.

16. Air chamber assembly comprising means defining a hollow air chamber casing, a first air flow duct formed in the casing for the passage of ventilation air to or from the interior of the casing, a support member, and spacer means which comprises heat-fusible means and which is disposed in supporting relation between the air chamber casing and the support member with the heat-fusible means under compression thereby to maintain an edge portion of the air chamber casing a pre-determined spaced distance from the support member, said pre-determined spaced distance defining a second air flow duct therebetween communicating with a space to be ventilated for the passage of ventilation air between the interior of the air chamber casing and said space, and the casing being urged in the direction to cause said edge portion thereof to enter into substantially air-tight sealing contact with the support member on fusion of the heat-fusible means.

17. Air chamber assembly comprising means defining a hollow air chamber casing, a first air flow duct formed in the casing for the passage of ventilation air to or from the interior of the casing, a support member, and spacer means which comprises heat-fusible means and which is disposed is supporting relation between the air chamber casing and the support member, with the heat-fusible means not under tensile stressing, thereby to maintain an edge portion of the air chamber casing a pre-determined spaced distance from the support member, said pre-determined spaced distance defining a second air flow duct therebetween communicating with a space to be ventilated for the passage of ventilation air between the interior of the air chamber casing and said space. and the casing being urged in the direction to cause said edge portion thereof to enter into substantially air-tight sealing contact with the support member on fusion of the heat-fusible means.

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