

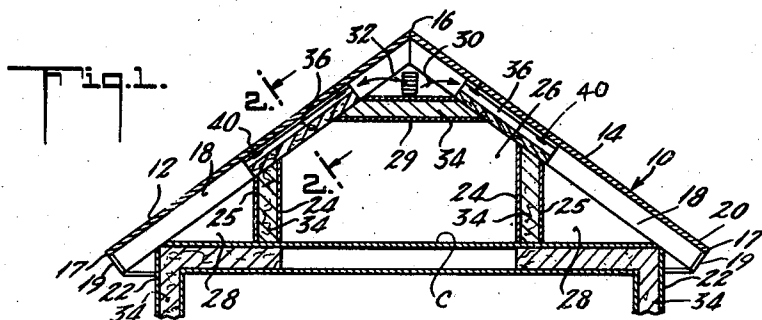
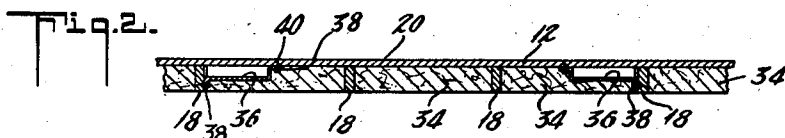
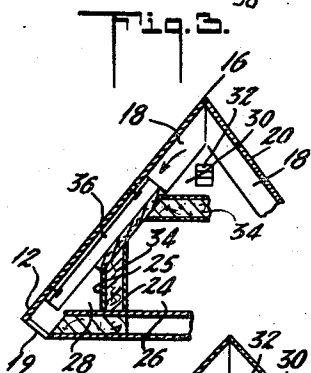
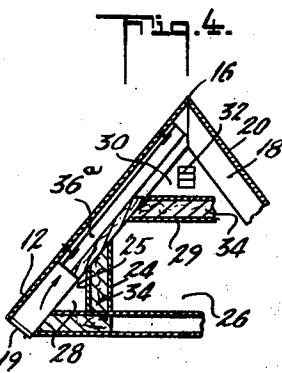
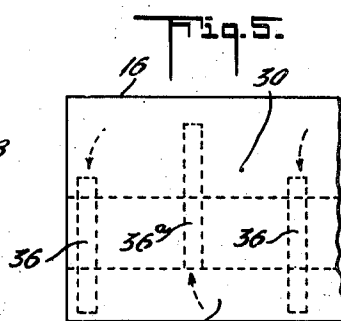
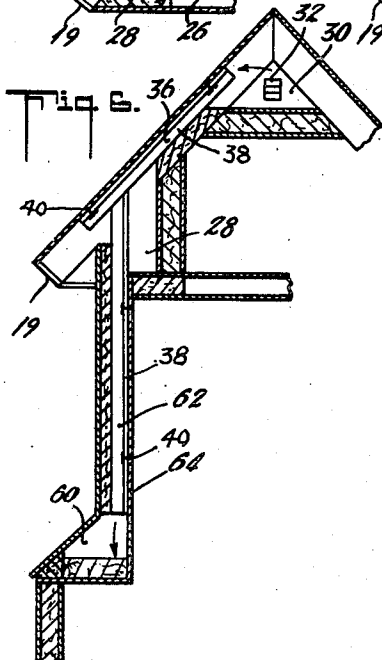
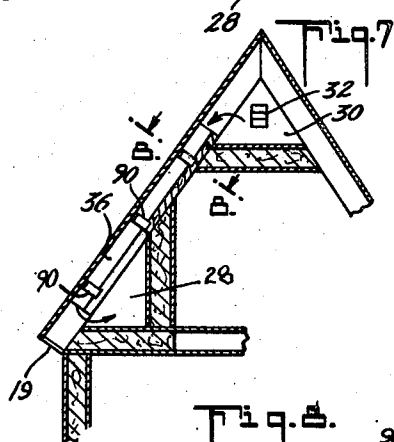
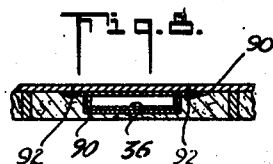
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METHOD OF EQUALIZING TEMPERATURES BY VENTILATION

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METHOD OF EQUALIZING TEMPERATURES
BY VENTILATION

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1 Claim. (Cl. 98—32)

1

My invention relates to a method and means for compensating or equalizing temperatures in building structures between sealed-in or enclosed spaces and spaces vented to the atmosphere.

The main object of my invention is to overcome the objectional results of temperature differentials between sealed and vented spaces in building constructions. In insulating buildings, as by the application of insulating material thereto (either sheet or roll material, or loose fibrous material, and the like), certain spaces are sealed from the atmosphere, i. e., as behind partitions or knee walls, under slanted parts of roofs, etc. Also in erecting buildings, it often happens that some small and out-of-the-way spaces are sealed off from the atmosphere. However created, these usually small spaces are seldom vented, by louvres or otherwise, either because of the expense or difficulty involved, or because the introduction of oddly situated ventilating means adversely affects the appearance of the building. One of the more serious effects of temperature differentials between vented and sealed spaces is to cause condensation in one or the other, depending on the season of the year, with its injurious after-effects.

The main object of my invention, therefore, is to provide a method and means of equalizing the temperature between vented and sealed spaces in buildings.

Another object of my invention is the provision of ducts and the location thereof as to bring sealed and vented spaces into communication.

Another object of my invention is the provision of a method and means of equalizing temperatures between sealed and air-vented spaces in building structures which comprises providing hollow ducts and bringing one end thereof into communication with a sealed space and bringing the other end of the duct into communication with a vented space.

Still another object of my invention is to so locate and arrange these ducts as to promote and increase air exchange as between vented and sealed areas.

I have discovered that it is possible to accomplish my objects and to equalize the temperatures between vented and sealed spaces, by providing a communicating duct or channel or a plurality thereof therebetween, and by so locating and securing the duct or ducts as not to interfere with the conventional insulating methods, means or materials.

In the drawings annexed hereto, forming a part hereof:

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Figure 1 is a vertical cross-sectional view of the upper portions of a conventional single span-roofed building, showing one modification of my invention applied thereto;

5 Fig. 2 is a section on the line 2—2 of Fig. 1;

Figs. 3 and 4 are vertical cross-sectional views through similar conventional structures showing a modified arrangement of my invention applied thereto;

10 Fig. 5 is a plan view of the arrangement shown in Figs. 3 and 4;

Fig. 6 is a vertical cross-section through a slightly different form of building, showing still another arrangement of my invention applied thereto;

15 Fig. 7 is a vertical cross-section through still another form of building, showing the application of a modified form of my invention applied thereto; and

20 Fig. 8 is a section on the line 8—8 of Fig. 7.

Referring to Figs. 1 and 2, reference numeral 10 indicates a conventional single span-roofed building, the two sides 12, 14 of the roof rising to crown 16. Each side comprises a plurality of rafters 18, 18 and a covering 20 (which may include sheathing, tiling, shingling or the like conventional outer material). The lower ends 17 of roof sides 12, 14 are conventionally closed off by cross-strips 19. The lower edges of each slanting roof section are rested atop side walls 22, 22. With slanted roof sides, a roughly triangular space is outlined at the top of the building, and where this is sought to be utilized, and a livable or usable room formed therefrom, knee-walls 24, 25—24, 25 are provided in from the lower edges of the roof sides, resting atop ceiling C. The arrangement provides a walled room as 26 at the top of the structure and sealed spaces 28, 28, behind and between the knee-walls 24, 25—24, 25 and the roof ends. This attic room is conventionally ventilated, as by windows or the like (not shown), and when—as is usually the case—the attic room 26 is ceilinged, as at 29, a triangular space 30 at the very top of the building is conventionally ventilated, as by louvres 32, or the like.

When buildings of the type illustrated are insulated, either sheet material or loose fibrous material 34, 34 may be disposed between walls 24, 25, inside ceiling 29, and on the underside of the roof sections 12, 14 and between the roof rafters 18, 18, depending on whether the walls and ceilings are single or double. If single, insulation in sheet form is preferably applied, but if double, as shown, loose fibrous insulating material may

be used, blown into the space between the double walls or ceilings, all resulting in a sealing off of spaces as 28, 28. These sealed spaces as 28, 28 will become excessively hot in warm weather and cause condensation in cold weather.

In order to relieve this condition, and in order to dispense with the necessity for any additional vents to the outside for these sealed areas, I provide a plurality of ducts or channels as 36, 36, and so dispose these as to bring one open end thereof into direct communication with a sealed space as 28 and the other open end into direct communication with a space either adjacent or remote) which is vented to the atmosphere, as 30.

One form of air duct or channel 36, as shown in Figs. 1 to 6 comprises a relatively shallow U-shaped casing, of wood, tin, fiberboard, or the like, having wing members or ears 38 by which the ducts can be nail or screw-40 secured to the sides of rafters 18 and the adjacent undersides of the roof. The ducts or channels may be rectangular, thin, flattened tubular sections, so as to occupy little space and permit the application of a proper amount of insulating material. As many ducts as may be needed or desired may be used, and they will present no obstacle or impediment to the application of insulating material, either the loose, fibrous variety or the sheet form.

As shown in Fig. 2, a plurality of ducts 36, 36 may be provided between the vented space as 30 and the sealed space as 28, as to assure good circulation and to equalize the temperatures therebetween, and relieve hot pockets in sealed space as 28 in the summer time and prevent condensation of moisture therein in cold weather.

The ducts may take various forms or shapes as above indicated. As shown in Figs. 1 to 6, they may comprise wide U-shaped trough-like members. As shown in Fig. 8, they may comprise hollow flat and thin tubular sections, and they may be secured either by supporting brackets as 90, and nails 92 (Fig. 8) or by nails, staples or screws 40 (Figs. 1, 2).

In all the figures parts similar to those in Figs. 1 and 2 are indicated by similar reference numerals. In the modification of my invention illustrated in Figs. 3, 4 and 5, the successively placed ducts are staggered in height in order to promote more rapid air movement in the direction of the arrows, the cold air moving downwardly and the warmer air rising upwardly. In Fig. 3, is illustrated the placing of the lower end of the duct 36 near the bottom of a sealed chamber or space 28, the cold air from vented space or chamber 30 passing downwardly through the duct. In Fig. 4, there is shown the next duct 36 disposed and secured so that the lower end thereof is near the top of sealed chamber 28, abetting the movement of warm air in chamber 28 up the duct and into vented chamber 30, the schematic arrangement being diagrammatically shown in Fig. 5, with alternately disposed ducts being staggered in height.

In Fig. 6, I have illustrated my invention as applied to the problem of equalizing the temperatures between sealed pockets or spaces as 60 in lower positions of buildings, with louvre 32 vented portions thereof as 30 in the upper portions thereof. I provide an elongated hollow duct or channel 62 and secure same to a wall 64 or other support so that the lower portion thereof is in

communication with the sealed space 60, and as shown, duct 62 may be of such length that the upper end thereof may be received into and communicate with duct 36 (as in Figs. 1 to 5). As will be readily understood, spaces 60 may be directly equalized with vented spaces 30, or through intermediately located spaces as 28, as desired or convenient for any particular installation, the desideratum being the placing and locating of ducts between vented and sealed spaces so as to equalize the temperatures therebetween. Single, elongated ducts may be used directly as between a lower sealed space 60 and an upper vented space 30, or ducts 62 may be led from a lower sealed space 60 into communication with the ducts as 36 from an intermediately located sealed space to an upper vented space 30, all as will be readily understood.

Figs. 7 and 8 merely illustrate the use of brackets as 90 to fasten ducts 36 either to the walls or roofs as by nails or screws 92, 92 between rafters 18, 18 instead of the rafters as shown in Fig. 2.

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

The method of modifying an already existing building to equalize temperatures therein as between an air-sealed area therewithin adjacent the eaves of the roof and an area adjacent the roof ridge in communication with the atmosphere, which method comprises positioning a plurality of elongated hollow ducts wholly within the outer walls of the building, with one end of each duct communicating with the sealed area and the other end of each duct communicating with the area in communication with the atmosphere, the lower end of each alternate duct being spaced below the lower end of each intermediately disposed duct, and the upper end of each intermediately disposed duct being spaced above the upper end of each alternate duct, whereby to promote more rapid air movement between the treated areas through the ducts.

ROBERT STEVENSON.

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