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JUNCTION CHAMBER FOR EQUALIZING PRESSURE OF CONDITIONED-AIR SUPPLY INCORPORATING RETURNED-AIR DUCT

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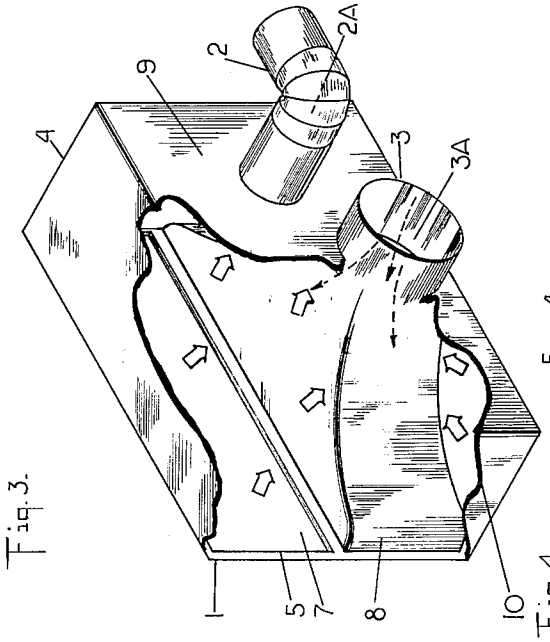


Fig. 3.

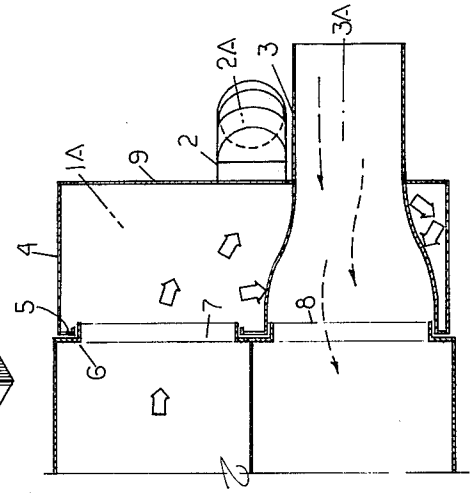


Fig. 4.

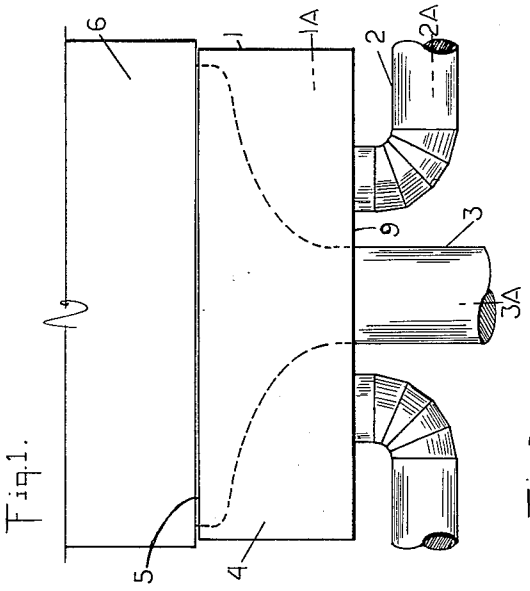


Fig. 1.

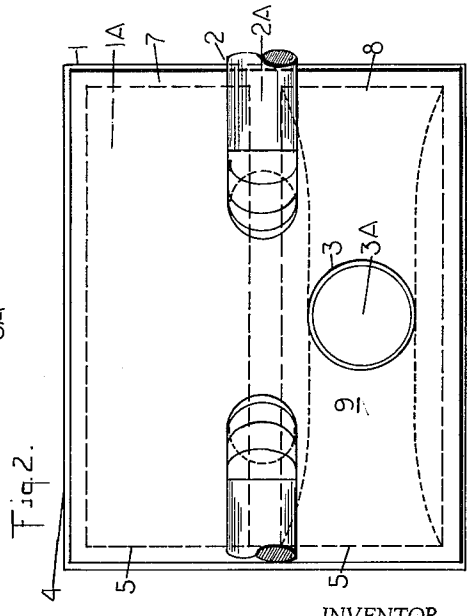


Fig. 2.

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JUNCTION CHAMBER FOR EQUALIZING PRESSURE OF CONDITIONED-AIR SUPPLY INCORPORATING RETURNED-AIR DUCT

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This invention relates to the equalization of the pressure of a volume of conditioned-air introduced into and contained within a chamber, the chamber holding the supply of conditioned-air which may be tapped by two, or more, outlet ducts as may be desired or required.

Various air-conditioning units of reversible type, known in the vernacular as heat-pumps, that is, for supplying air heated or refrigerated as desired, are presently in use or under development. One object of this invention, as titled above, is to provide means by which, when used in combination with such an air-conditioning unit, or heat-pump, the conditioned-air produced thereby may be equally pressurized within a chamber, for the purpose, causing an evenly pressurized supply of the conditioned-air to outlet ducts. In addition to this novel and valuable object, there is, further, the object to provide a compact arrangement by which the outlet ducts may be readily and conveniently spaced in attachment to the junction chamber so that conditioned-air, from the chamber, tapped by ducts, may be directed in multiple directions to the desired, or required, areas for use. The chamber, itself, is installed, generally, within or through, adjacent or contiguous to a wall or ceiling segment, floor, or the like. Also, another important and novel object of the invention of this particular chamber is to provide a suitable and compact means by which the return of air from areas of use, such returned-air being generally exhausted of its air-conditioned characteristics, is made directly to the air-conditioning unit, or heat pump, through a returning-air duct sealed within and penetrating through the chamber.

The device is manufactured, preferably, of sheet metal, or of other relatively stiff fibre, plastic and rubber, or of material found or deemed suitable, and the device is intended for installation primarily by the construction and building profession or trade.

The heretofore stated novel and valuable objects of the invention may be ascertained in greater detail by reference to the accompanying drawing which illustrates a typical embodiment.

FIGURE 1 is a plan view depicting the top of the junction chamber.

FIGURE 2 is a view of the front elevation of the chamber, drawn to the same line as FIGURE 1.

FIGURE 3 is a perspective view with cut-away of approximately three-quarters of the front elevation, one of the outlet ducts, and the entire left side of the chamber, thus, showing the interior.

FIGURE 4 is a vertical cross-sectional view diagrammatically indicating the relation of the junction chamber conjoined to an air-conditioning unit.

Referring to the drawing, the small numbers designate the same parts appearing in all the views.

In FIGURE 1, it is readily discernible that a chamber **1** is provided for holding, as in a reservoir, the supply of a volume of conditioned-air **1***a*. Within this total volume **1***a* of the chamber **1**, the conditioned-air **1***a* is found to be under a definite and given, even pressure by reason of its physical containment within the chamber **1**. The chamber **1** may have joined to it in tapping attachment two, or more, outlet ducts **2**, so attached to the front side **9**, not overlooking the possibility that such outlet ducts **2**, generally, may be so attached, also, to the top **4** as well as to the right and left sides and the bottom of

the chamber **1**, as may be required. It follows that the conditioned-air **2***a*, supplied under pressure by the air-conditioning unit, is conducted from the pressurized reservoir volume **1***a* via the outlet ducts **2** in multiple directions to areas of use, elbows being used in the continuation of the outlet ducts **2**, as is well understood.

There is shown the returned-air duct **3** which is sealed within and which penetrates through the chamber **1**. The returned-air duct **3** conducts the returned-air, returning from areas of use, back through the chamber **1**, that is, the volume **3***a* being entirely sealed off, airtight, from the conditioned-air volume **1***a*. The returned-air duct **3** is joined by method of welding, or the like, at the points of penetration of the chamber **1**, generally at the front side **9** and at the back side **5**, so that the returned-air duct **3**, within and without, and the chamber **1** are made airtight respectively.

Also, in FIGURE 1, diagrammatically, there is shown the back side **5** of the chamber **1** placed in position in airtight connection with the face section **6** of an air-conditioning unit, or heat pump.

In FIGURE 2, it will be observed that the back side **5** of the chamber **1** is arranged as may be required to meet contiguously and to join to the face **6** of an air-conditioning unit in two distinct, congruous, and airtight sections, or apertures, namely: upper **7** and lower **8**, as shown by the dotted lines. The upper aperture **7** of the back side **5** is joined to the upper section of the face **6** of the air-conditioning unit from which section is supplied and obtained the conditioned-air **1***a* introduced into the chamber **1**, filling the volume **1***a*, as a reservoir, under a definite, given pressure. The lower aperture **8** of the back side **5** is joined to that section of the face **6** of the air-conditioning unit which receives back to itself the returned-air **3***a* for processing or treatment. It will be observed that the generally round, tubular returned-air duct **3** may modify gradually to become rectangular, as it progresses through the chamber **1** from the front side **9** to the back side **5**, thereby presenting a rectangular shape at the lower aperture **8** to fit congruously and airtight to that section of the face **6** of the air-conditioning unit which receives the returned-air **3***a*, and which may be substantially shaped to require such a rectangular shape at the termination of the returned-air duct **3** to so fit. Other modification may be made of the returned-air duct **3**, without alteration of the operating principle of this device and of the member, to terminate in square or oval shape, or other, and of different size, as may be required to fit as hereinbefore disclosed, depending upon the particular design of the conjoined air-conditioning unit, as is well understood. Also, similarly, depending upon the particular design of an air-conditioning unit, modification of shape and size may be made as may be required of the upper aperture **7** of the chamber **1** pertaining to its congruous and airtight juncture with that section of the face **6** of the conjoined air-conditioning unit from which section the conditioned-air **1***a* is obtained and introduced into the conditioned-air reservoir volume **1***a*.

In FIGURE 3, illustration is made of the conditioned-air volume **1***a* within the airtight junction chamber **1**, with the short, thick arrows indicating the general interior volume provided for the conditioned-air **1***a*, as in a reservoir, including that volume totally surrounding, circumferentially, the penetrating returned-air duct **3** as it progresses through the chamber **1**. The light dotted arrows indicate the returned-air volume **3***a* within the returned-air duct **3**, which is airtight also, the returned-air **3***a*, thus, being conducted back to the air-conditioning unit.

Without alteration of the novel operating principle of this device, or of any members thereof, it is here speci-

fied that all of the surfaces of the junction chamber **1**, in particular, all of the interior surfaces, as well as the external surface of the within sealed returned-air duct **3**, may be treated with insulation material, as indicated by the designated segment of insulation material **10**, for the purpose of insuring greater stability in the temperature of the conditioned-air **1***a* while it is contained in the chamber **1**, and to reduce or muffle vibratory sound which, otherwise, may be transmitted from the conjoined air-conditioning unit.

The preceding explanations of FIGURE 2 and FIGURE 3 will generally apply in describing the cross-sectional view, FIGURE 4.

In the foregoing there is disclosed and made manifest a distinctly novel and worthy device comprising a junction chamber which evenly pressurizes a volume of conditioned-air introduced therein for convenient and compact supply through outlet ducts to areas for use, while returned-air is conducted through the junction by means of an incorporated returned-air duct penetrating, sealed within, and made airtight within the junction chamber.

As the disclosures herein might well be altered otherwise without defeating their novel and practicable applications, I do not wish to be confined to the embodiment illustrated herein further than I am limited by the scope of the appended claims.

I claim:

1. A combination comprising airtight, contiguous and congrous juncture of an air-conditioning unit with a junction chamber defining an interior reservoir volume with a top, bottom, front, back, and right and left sides, the said back side comprising two apertures adapted to conjoin said chamber to said air-conditioning unit in said combination, the first said aperture providing means to join said back side in said juncture with the section of the face of said combined air-conditioning unit whence a supply of conditioned-air is introduced through said first aperture under pressure to said interior reservoir volume within said chamber, a plurality of outlet ducts affixed in tapping attachment to said chamber providing conduct of said supply of conditioned-air from said interior reservoir volume, the second said aperture providing means to join said back side in said juncture with the section of the face of said combined air-conditioning unit to which air is returned, airtight means comprising a returned-air duct penetrating the said front side of said chamber and passing directly through the said interior reservoir volume of said chamber, sealed airtight at juncture of said penetrating and said front side of said chamber and at juncture to said second aperture of said back side, there terminating in fitting juncture with said second aperture and said section of said face of said air-conditioning unit in said combined combination.

2. A junction chamber having a top, bottom, front, back, and right and left sides defining an interior reservoir volume, the said back side adapted to join the said chamber in airtight, contiguous and congruous conjunction to the face of an air-conditioning unit, the said back side comprising two apertures, the first said aperture adapted to join in said conjunction to the section of said face of said conjoined air-conditioning unit whence conditioned-air is supplied under pressure, the said chamber adapted to contain the said supply of conditioned-air under pressure within said interior reservoir volume, a plurality of outlet ducts affixed in tapping attachment thereto, the second said aperture adapted to join in said conjunction to the section of said face of said conjoined air-conditioning unit to which air is returned, airtight means comprising a returned-air duct penetrating the front side of said chamber and passing directly through the said interior reservoir volume of said chamber, sealed air-tight at juncture of said penetrating and said front side of said chamber and at juncture to said second aperture of said back side, there terminating in modified size and shape to fit said juncture of said second aperture and said section of said face of said conjoined air-conditioning unit in said conjunction, said returned-air duct being surrounded circumferentially within said chamber by said interior reservoir volume within said chamber.

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