July 12, 1955 J. E. PALMER 2,712,737

BUILDING WALL ADAPTOR FOR AIR CONDITIONING APPARATUS

Filed June 1, 1954

2 Sheets-Sheet 1

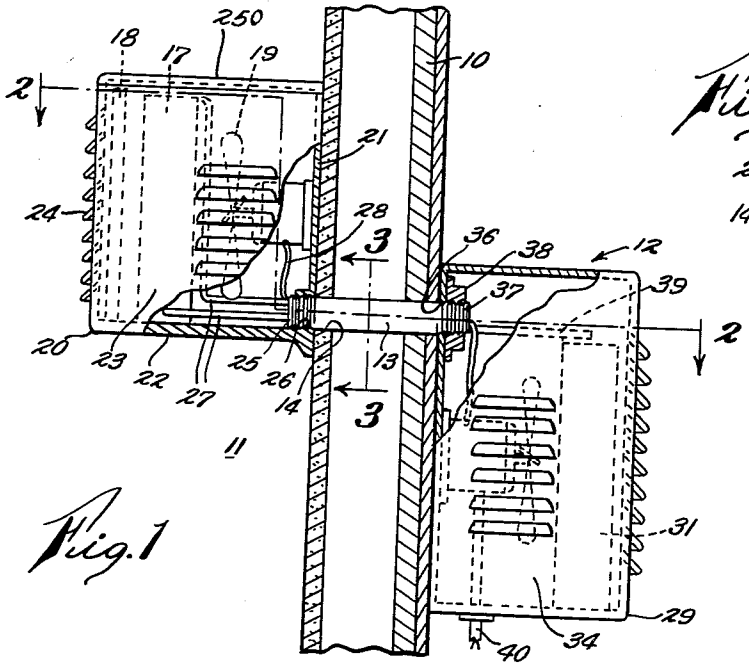


Fig. 1

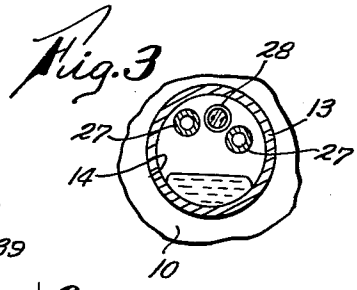


Fig. 3

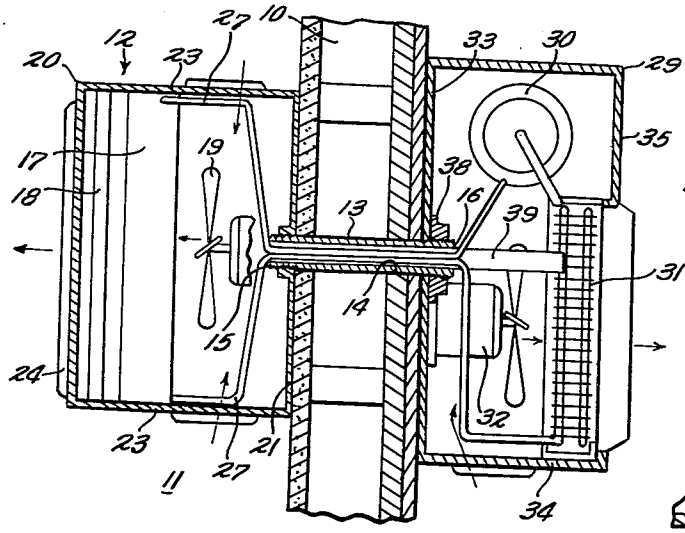


Fig. 2

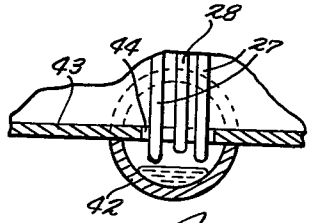


Fig. 5

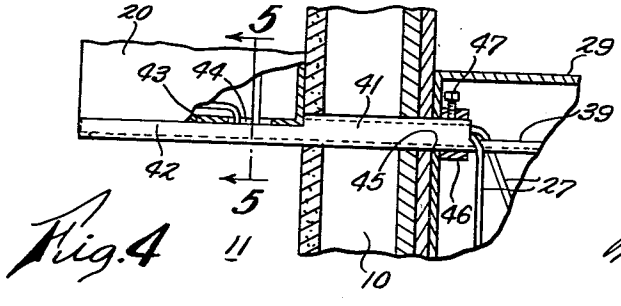


Fig. 4

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2 Sheets-Sheet 2

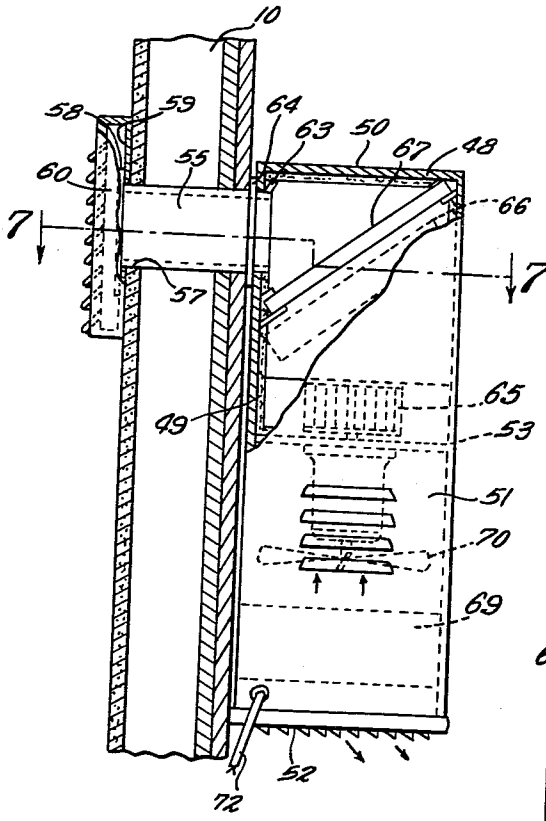


Fig. 6

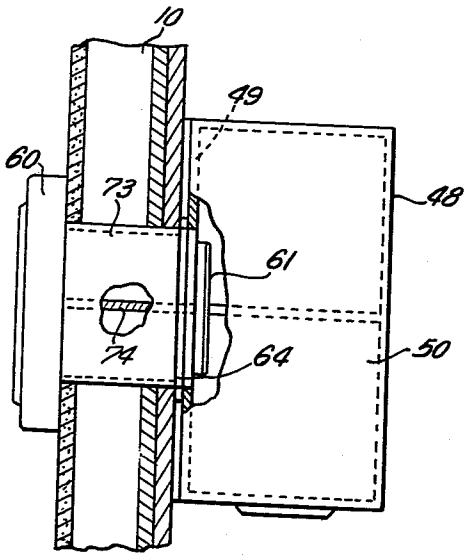


Fig. 8

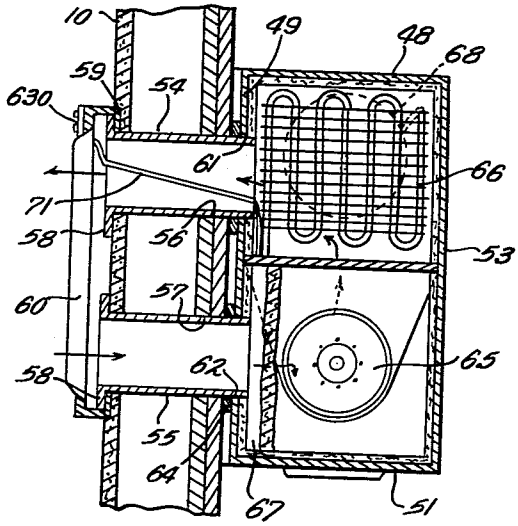


Fig. 7

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BUILDING WALL ADAPTOR FOR AIR CONDITIONING APPARATUS

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Application June 1, 1954, Serial No. 433,487

4 Claims. (Cl. 62—129)

The present invention relates to an improved adaptor for mounting air conditioning apparatus on the outside wall of a building structure.

The adaptor consists essentially of a small diameter, straight tube extending through an opening made entirely through a building wall and of a diameter to accommodate said tube, the free ends of the tube projecting beyond the interior and exterior faces of a building wall and serving as the only supports for the housing units for mechanical air conditioning apparatus and cooperating with housing unit connecting means which permanently secure the apparatus in place on the wall.

A further object of the invention is to provide an extremely simple, yet permanent installation for housing air conditioning apparatus which may be readily assembled on the outside wall of a building.

Other objects and advantages of my invention will be apparent from the following specification taken in connection with the accompanying drawings which set forth preferred embodiments of my invention; wherein like numerals indicate similar parts throughout the several views.

In the drawings:

Fig. 1 is a side elevational view of an air conditioning apparatus embodying the features of my invention, the outside building wall and parts of the apparatus being shown in section.

Fig. 2 is a section taken on line 2—2 of Fig. 1.

Fig. 3 is an enlarged section taken on line 3—3 of Fig. 1.

Fig. 4 is a fragmental view similar to Fig. 1 showing a modified form of my apparatus.

Fig. 5 is an enlarged section taken on line 5—5 of Fig. 4.

Fig. 6 is a side elevational view of another modification of my invention, parts of the apparatus being broken away and shown in section.

Fig. 7 is a section taken on line 7—7 of Fig. 6.

Fig. 8 is a view like Fig. 7 showing a further modified form of my invention.

In Figs. 1–3 there is shown an outside wall 10 of a building structure such as a residence that has one or more rooms 11 that are to be air conditioned by the apparatus generally indicated by the reference numeral 12. In order to apply the air conditioning apparatus 12 to an outside building wall of the character depicted I have provided an adaptor which takes the form of a straight open-ended tube 13, of relatively small diameter, which extends through a small pre-formed hole 14 made entirely through the building wall 10 from a room 11 inside the building to the outside atmosphere. This tube has its opposed open ends 15 and 16 projecting beyond the inside and outside faces, respectively, of the building wall and is preferably round in cross section (Fig. 3) and made of non-corroding metal or plastic material.

The low side of the air conditioning apparatus depicted in the drawings includes the usual evaporator coil 17, air filter 18 and blower 19 housed within a cabinet 20 located against the inside face of the building wall 10 within the

room 11 to be air conditioned. This cabinet has a back wall 21, a bottom wall 22, louvered sides and front walls 23 and 24 and a removable top wall 25, it being understood that the blower draws air in a desired volume from the room through the louvered side walls 23 of the cabinet and forces it past the evaporator coil 17 and air filter 18 to condition it before it is introduced into the room through the louvered front wall 23 of the cabinet.

The cabinet is supported on the wall 10 by the adaptor tube 13 by means of a cooperative connecting means on the lower central portion of the back wall 21 thereof, said means being shown in Figs. 1–3 as an internally threaded opening 25 formed through the back wall and which cooperates with exterior threads 26 on the end 15 of the said tube. The tube acts as a conduit for the various pipes 27 carrying refrigerant to the evaporator coil from the low side of the system as well as for electric wires 28 serving the blower 19. It will be particularly noted that the adaptor tube is substantially on a level with the bottom wall 22 of the cabinet whereby condensate from the evaporator which collects in the bottom will pass by gravity through the tube to the high side of the system for disposal thereby.

The high side of the refrigerating system is enclosed in a casing 29 located on the outside face of the wall 10, said high side comprising the conventional self contained compressor 30, condenser 31 and blower 32. The casing includes a front wall 33, and a louvered side and back wall 34 and 35, respectively, the back wall being preferably removable for purposes of installation and servicing. The casing is mounted on the outside face of the wall 10 with the adaptor tube 13 by a cooperative connection which is shown in the drawings as comprising an aperture 36 formed through the central upper portion of the front wall 33, the open end 16 of the tube being externally threaded at 37 to cooperate with a large pull up nut 38 which when tightened securely and permanently mounts both the cabinet 20 and casing 29 on the wall 10.

The blower 32 acts in the usual way to draw outside air through the louvered side wall 34 of the casing and across the condenser 31 to the atmosphere through the louvered back wall 35 to thereby cool the coils of the condenser. Condensate carried through the adaptor tube 13 from the evaporator 17 is disposed of by causing it to flow over the hot coils of the condenser 31, this being best effected by forming a trough like extension 39 preferably integral on the open end 16 of the adaptor tube 13. The usual electric service line 40 for the blowers and compressor motors may be introduced through a sealed opening in the bottom of the casing 29.

With reference to Figs. 4 and 5 there is shown a modified form of adaptor which has a tubular portion 41 passing through a small diameter hole formed in the building wall 10. That part of the adaptor which projects into the room is cut longitudinally into a part 42 that is half circular in section and is welded along its longitudinal edges to the central portion of the under surface of a bottom wall 43 for the cabinet. An opening 44 is formed in the bottom wall 43 in alignment with the part 42 to establish communication between the interior of the cabinet and the tubular portion 41 of the adaptor. The front wall of the outer casing is provided with an opening 45 for receiving the open end of the tube, said end projecting into the casing 29 and fitted with a collar 46 that is secured to the end by a set screw 47. As in the case of the adaptor shown in Figs. 1–3 the adaptor in Figs. 4 and 5 serves as a conduit for refrigerant pipes 27, electric lines 28 and condensate drainage of the apparatus whilst acting as the sole support upon a building wall 10 of the cabinet 20 and casing 29 housing the air conditioning apparatus.

Now with reference to Figs. 6 and 7 of the drawings there is shown an air conditioning apparatus that has both

its high and low sides located on the outside of a building wall 10 within a housing 48. The housing includes a front wall 49, a top wall 50, louvered side and a bottom wall 51 and 52, respectively, and an imperforate rear wall 53. As best shown in Fig. 7 two adaptor tubes 54 and 55 extend through openings 56 and 57, respectively, formed through the outside wall 10. The tubes have the edge portions 58—58 of their open outer ends bent at right angles against the interior face of a back wall 59 of a suitable grill structure 60, thereby constituting the tubes the sole support of the grill structure on the wall 10. The opposite, rearwardly projecting open ends of the tubes project beyond the exterior face of the building wall 10 and are respectively received in openings 61 and 62 formed through the upper portion of the front wall 49 of the housing. Cooperative connections between the front housing wall and the tubes take the form of rearwardly extending lips 63 (Fig. 6) struck upwardly from the upper edge portion of the open ends of the adaptor tubes to contact that part of the interior face of the front housing wall adjacent to and above the respective tubes, to thus constitute the tubes the sole support for the air conditioning apparatus on the building wall. The grill structure 60 serves as a decorative cover for the openings made by the adaptor tubes 54 and 55 and to direct flow of air to and from the said tubes. Suitable controls 63 for the apparatus may be conveniently mounted on this grill, if desired. The tubes pass through a ring like seal or gasket 64 which is interposed between the building wall 10 and the front wall 49 of the housing to form a weather tight connection therebetween.

Suitable air conditioning apparatus is located within the housing 48 and is shown as having a low side comprising a blower 65 mounted within an upper compartment of the housing, said blower being adapted to draw air from the room through the tube 55 and force said air past an evaporator 66; located in an adjoining upper housing compartment; and out through the tube 54 into the room. The usual air filter 67 may be interposed between the tube 55 and the blower 65 to cleanse the air, if desired. As indicated in the drawing the inside faces of the walls of housing 48 that enclose the low side of the air conditioning apparatus are lined with insulation for reasons of efficiency since the high and low sides are adjacent each other on the outside of the building wall 10 and there will generally be a great temperature difference between the low side and the circumambient air of the housing and the high side. The high side of the apparatus is located in the lower part of the housing and comprises a self contained compressor 68 and a condenser 69; outside air being drawn through the louvered side wall 51 of the housing by a blower 70 and forced by said blower over the condenser coils and out the louvered bottom wall 52. As shown in Fig. 7 electric wires 71 for electric motors that drive the compressor and blower are led from the controls 63 through the tube 54 to their respective motor connections, electric power lines for the apparatus being indicated by the numeral 72.

In Fig. 8 there is depicted another modification of my adaptor which comprises a single tube 73 divided by a central partition 74 into an air inlet passageway and an air outlet passageway, said tube adaptor and air conditioning apparatus therefor being in every other respect similar to the device illustrated in Figs. 6 and 7.

Assembly

A hole or holes for snugly receiving my adaptor tube is first formed through the building wall 10. In the case of existing structures these holes may be drilled or otherwise formed with conventional tools and in new buildings provision can be made during construction to provide the necessary opening for my adaptor tube or tubes. In the case of the adaptor shown in Figs. 1, 2 and 3 the threaded end 26 of the tube 13 is first turned tightly into the threaded opening 25 in the rear wall 21 of the inside cabinet 20 and this assembly mounted on the inside face of wall 10 by inserting the tube through the opening 36. The outside casing 29 is then hung on the opposed threaded end 37 of the tube by inserting said end through the opening 36 in the front wall 33 of said casing after which the nut 38 is threaded on said end 37 and drawn up tightly to permanently secure the adaptor and housings in place on the wall. The various refrigerant pipes and electric connections can then be fitted and installed in the apparatus. The foregoing procedure is followed with respect to the adaptor shown in Figs. 4 and 5 of the drawing, it being noted that the adaptor tube 41 is made an integral part of the cabinet 20 by reason of its being welded to the bottom wall 43 thereof.

With reference to Figs. 6–8 of the drawings the foregoing procedure is substantially followed for installation of the illustrated adaptor, it being noted that a pair of somewhat larger holes 56 and 57 must be first formed in the building wall 10 for the reception of the tubes shown in Figs. 6 and 7 or a single greatly enlarged hole is made in the wall for the adaptor of Fig. 8. In either event the tube or tubes are inserted into the pre-formed holes or hole in the wall 10, the inner ends 58 of the tube or tubes being bent outwardly to engage against the inside face of the wall, whilst the opposed end of the tube or tubes are passed through suitable holes in the front wall 49 of the housing 48 and secured thereto by turning the lip 61 back against the said housing wall.

Modifications in the details of this adaptor may obviously be made without departing from the spirit and scope of this invention as it is defined in the appended claims; it being further understood that the adaptor and housing arrangements disclosed herein may be employed in all types of air conditioning apparatus other than the disclosed refrigerating apparatus such as air heating, ventilating, filtering or air drying apparatus or apparatus combining two or more of the foregoing types.

What is claimed is:

1. In combination with an outside building wall having a relatively small, pre-formed hole therethrough, a straight adaptor tube set in and having its end portions projecting beyond the major faces of the outside wall, a first casing located on the exterior side of said wall and mounted on an end portion of the tube, a second casing located on the interior side of said wall and mounted on the opposed end portion of the tube, said casings being adapted to house complementary parts of an air conditioning apparatus and the adaptor tube forming the only means of support for said casings on the wall, an opening formed through at least one of the casings for receiving the projecting end portion of the adaptor tube, and fastening means cooperable with the said end portion of the tube for securing the casing to the tube.

2. The combination as set forth in claim 1 wherein the fastening means comprises external threads formed on the end portion of the tube, and a nut threaded on said end portion and engaged against the casing.

3. The combination as set forth in claim 1 wherein the fastening means comprises a collar on the end portion of the tube engaged against the casing, and a set screw threaded in the collar and bearing at its inner end against the tube end portion.

4. The combination as set forth in claim 1 wherein the fastening means comprises a lip struck from the upper part of the end portion of the tube, said lip being turned back against the casing.

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