

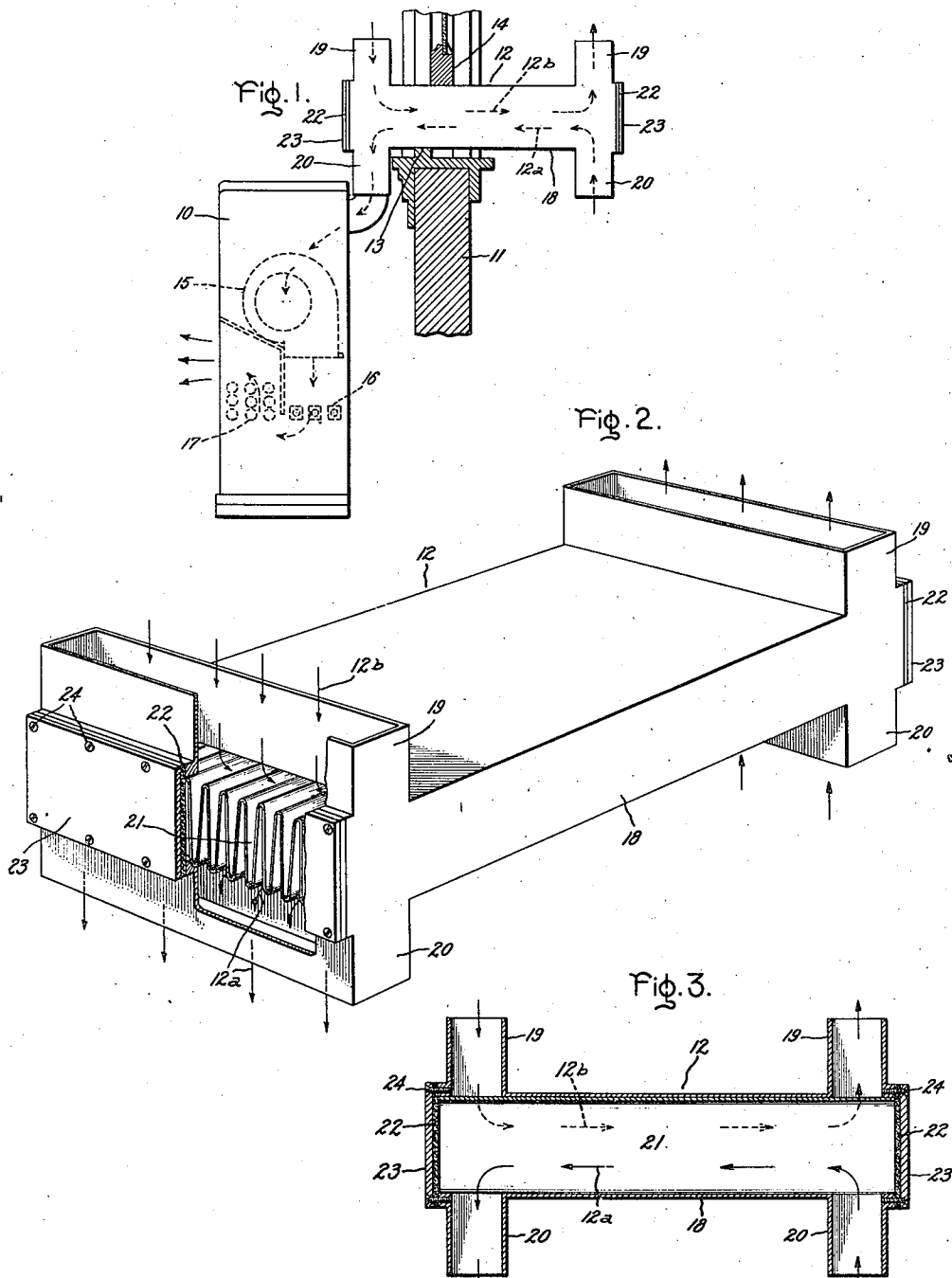
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AIR CONDITIONING APPARATUS

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AIR CONDITIONING APPARATUS

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1 Claim. (Cl. 257—245)

My invention relates to air conditioning apparatus, and particularly to devices for transferring heat between the air admitted to and the air exhausted from a room to be air conditioned.

5 The air exhausted from a room to be air conditioned is normally at a temperature different from that of the fresh air which is drawn into the room from the outside. When a room is being heated in the winter considerable heat is exhausted with the air to the outside, and when the room is being cooled in the summer considerable heat is admitted from the outside with the warm outside air. It is desirable to prevent the heat from leaving the room with the air in the winter and to reduce the temperature of the incoming air in the summer.

10 Accordingly, it is an object of my invention to provide an improved heat exchange attachment for air conditioning apparatus so arranged that heat will be transferred between the incoming and outgoing air and raise the efficiency of the air conditioning system.

15 Another object of my invention is to provide a heat exchange attachment for air conditioners, which shall be of simple and rugged construction and which shall provide an ample heat exchanging surface within a comparatively small enclosure.

20 Further objects and advantages of my invention will become apparent as the following description proceeds and the features of novelty which characterize my invention will be pointed out with particularity in the claim annexed to and forming a part of this specification.

25 For a better understanding of my invention reference may be had to the accompanying drawing in which Fig. 1 is a side elevation showing an air conditioning unit mounted adjacent a window and provided with a heat exchange attachment embodying my invention; Fig. 2 is a perspective view partly in section of the heat exchange attachment shown in Fig. 1, and Fig. 3 is an enlarged sectional view of the heat exchange attachment.

30 Referring now to the drawing, in Fig. 1 I have shown an air conditioning unit 10 mounted in a room adjacent a wall 11 and provided with a heat exchange attachment 12 embodying my invention and arranged to extend through a window opening between the casing 13 and the sash 14. The attachment 12 completely fills the lowermost portion of the window opening and the sash 14 closes against the attachment, and may be raised if desired. The air conditioning unit 10 includes a fan 15 which draws air in from the

outside through the attachment 12, as indicated by the lower arrows 12a and propels it downwardly over a heater 16 and a cooler 17, thence out the front of the unit. When the room is being heated, as in the winter time, only the heating unit 16 is in operation, and the air drawn in from the outside is at a lower temperature than that of the air in the room. When the air is forced into the room by the fan 15, the air displaced is forced out through the attachment 12, as indicated by the upper arrows 12b and the heat from the air is transmitted to the incoming air, the temperature of which is raised thereby. When the room is being cooled, as in the summer time, only the cooling unit 17 is in operation and the air within the room is at a temperature lower than that of the air outside. Under this condition of operation warm air is drawn in by the fan and cooled air is exhausted. The heat transfer is then from the warmer incoming air to the cooler exhausted air. The incoming air is thereby cooled thus reducing the amount of cooling necessary when the air is passed over the cooling unit 17. It will be evident that when the apparatus is heating or cooling the total energy required has been reduced by the transfer of heat between the exhaust and intake air, and that energy is saved which would otherwise be lost thereby increasing the efficiency of the air conditioning system.

35 Referring now to Fig. 2, in accordance with my invention the heat exchange attachment 12 comprises an elongated rectangular main casing 18 having openings at the top and bottom at either end and vertically extending ducts 19 and 20 opening upwardly and downwardly respectively and communicating with the openings, thus providing an H-shaped casing. Within the casing and extending longitudinally thereof is an extended baffle 21 in the form of a corrugated metal sheet of zig-zag cross section, the corrugations of which extend from the top to the bottom of the casing 18 and divide the casing into two sets of parallel ducts, one set on the upper side of the baffle 21 and the other set on the lower side. The baffle 21 may be constructed of any suitable sheet metal. I prefer to use a thin sheet of aluminum or some other metal in which a protective coating of oxide will be formed which does not insulate the sheet against heat transfer. Leakage between the top and bottom sets of ducts at their opposite ends is prevented by a sheet of packing material 22 held against the ends of the baffle 21 by removable closure plates 23 secured to the ends of the casing 18 by screws 24. One end of the at-

tachment 12 is arranged within the room to be conditioned while the other end is on the outside of the building. The duct 20 on the inside is connected with the air conditioning apparatus, as shown in Fig. 1, while the inner duct 19 is left open to the air in the room. The inner duct 19 may be extended so that it opens into any desired portion of the room. The path of the air flowing through the heat exchange attachment during operation of the air conditioning unit is clearly shown in Fig. 3. Air entering the room flows first through the outer duct 20 into the casing 18 and through the casing 18 horizontally in the set of ducts formed on the lower side of the baffle 21, and then downwardly through the inner duct 20 to the air conditioning unit, the path of the incoming air being indicated by the lower set of solid arrows. The outgoing air flows downwardly through the inner duct 19 into the casing 18 and horizontally through the set of ducts formed on the upper side of the baffle 21, as indicated by dotted arrows, and then upwardly through the duct 19 to the outside of the building. The incoming and outgoing air streams are then in counterflow and heat exchange is effected in the desired direction to decrease the losses in the air conditioning system.

It is apparent from the foregoing that I have provided a heat exchange attachment for air conditioning apparatus which is of simple and rugged

construction and which makes possible a highly efficient operation of the air conditioning apparatus.

While I have shown and described my invention as applied to a heat exchange attachment for air conditioning units, other applications will be readily apparent to those skilled in the art, and I do not desire my invention to be limited to the construction shown and described and I intend in the appended claim to cover all modifications within the spirit and scope of my invention.

What I claim as new and desire to secure by Letters Patent of the United States, is:

An attachment for an air conditioning device or the like including a casing of rectangular cross section arranged to extend through an opening in the wall of a room, said casing being open at the ends thereof and having openings near the ends at the top and bottom thereof, a baffle of zig-zag cross section arranged longitudinally within said casing and in contact with the top and bottom walls of the duct, and means including a removable closure plate and a sheet of packing material for sealing the ends of said baffle and for dividing said casing into two ducts, one of said ducts communicating with the openings in the upper side of said casing and the other of said ducts communicating with the openings in the lower side thereof.

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