

[54] DAMPER CONSTRUCTION

[75] Inventor: **Norman B. Wenig**, Scarsdale, N.Y.

[73] Assignee: **Thermal Science Corporation**,
Farmingdale, N.Y.

[22] Filed: **May 22, 1972**

[21] Appl. No.: **255,432**

[52] U.S. Cl. **165/55, 98/40 C, 137/625.31,**
165/96, 165/129

[51] Int. Cl. **F24h 3/00**

[58] Field of Search **165/55, 53, 96; 98/40 C;**
137/625.31

[56]

References Cited

UNITED STATES PATENTS

2,566,033	8/1951	Reeves.....	165/96 X
3,628,441	12/1971	Ardussi et al.....	98/40 C
2,722,403	11/1955	Guerra et al.....	98/40 C X

3,431,943 3/1969 Armand..... 137/625.31

FOREIGN PATENTS OR APPLICATIONS

1,005,966 1965 Great Britain..... 165/55

Primary Examiner—Albert W. Davis, Jr.

Assistant Examiner—Sheldon J. Richter

[57]

ABSTRACT

An improved damper construction for a heat exchanger in which heating or cooling surface is contained within a hollow wall structure and air entering through an inlet of the wall structure flows in contact with the heating/cooling surface and exits through an elongated outlet of the wall structure. The improved damper is hollow and has slot apertures that allow a limited outflow of air when the damper is closed, and present less interference to air flow when the damper is open.

1 Claim, 2 Drawing Figures

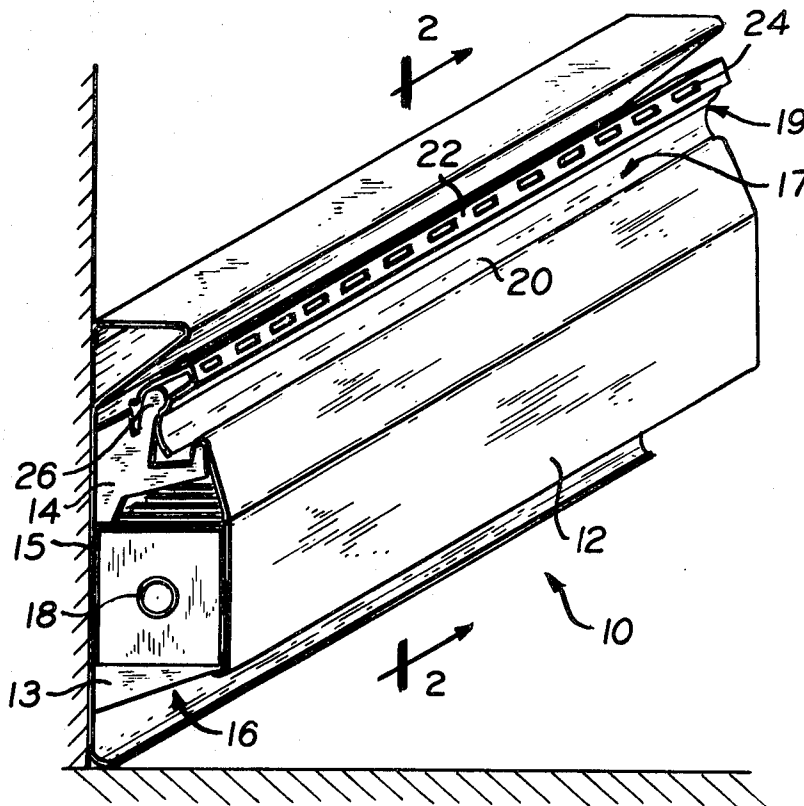
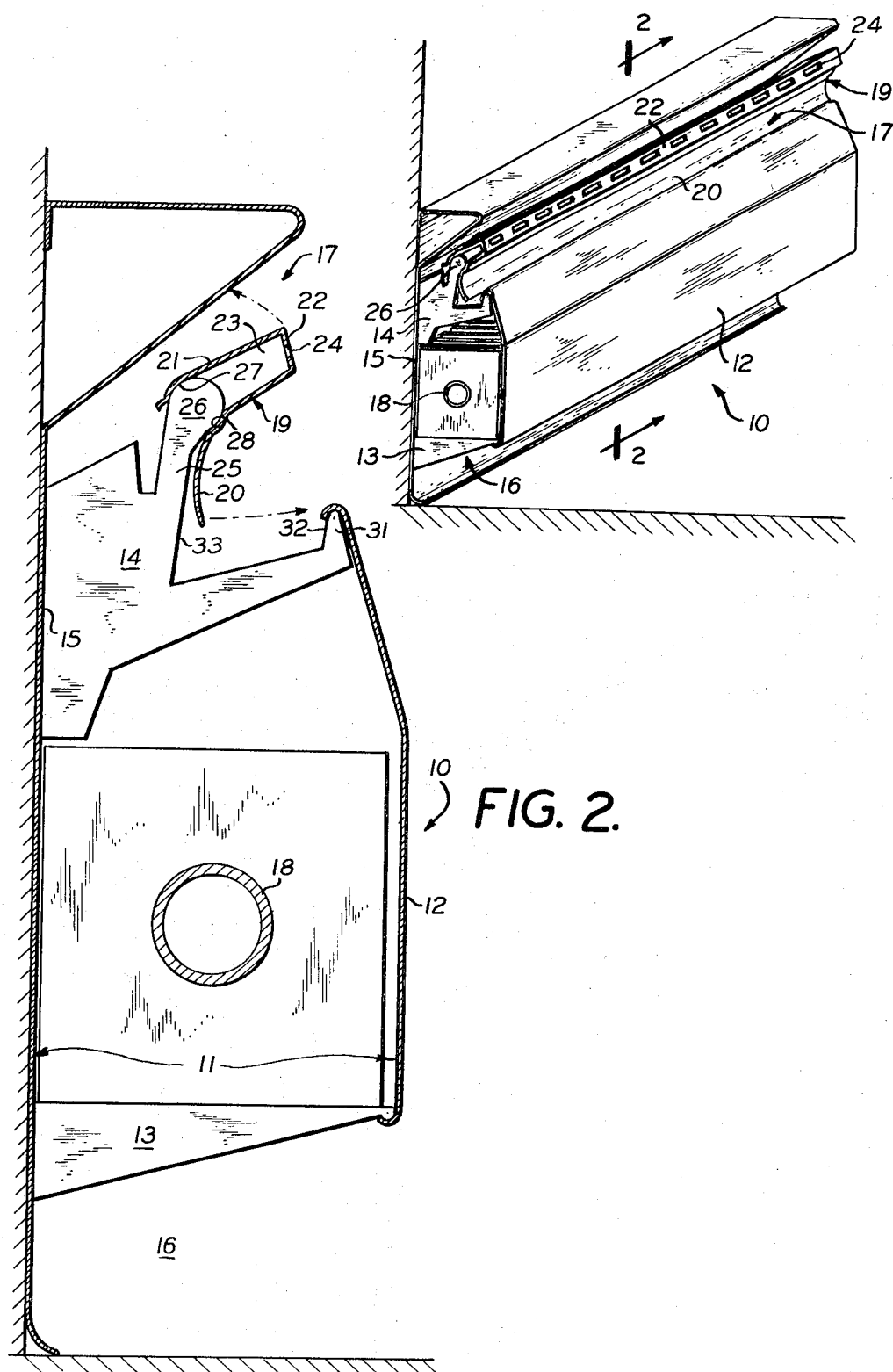


FIG. 1.



DAMPER CONSTRUCTION

BACKGROUND AND SUMMARY OF THE INVENTION

The present invention relates in general to heat exchangers, and more particularly to an improved damper construction for a heat exchanger.

There are a variety of known heat exchangers commonly used in residential and commercial buildings for heating and/or cooling, and which are manufactured in the form of endwise connectable units that are installed along the base of interior walls. Such heat exchanger units typically have panels connected to form a hollow wall structure with an inlet extending along the floor line and an outlet extending at a height above the floor. Heat exchange surface means, commonly in the form of a finned tube which carries the heating or cooling fluid, is positioned inside this wall structure for heat exchange with air entering through the inlet and exiting through the outlet.

Particularly in the case where the heat exchanger is used as a baseboard radiator in a hot water heating system, the dominant mode of heat exchange is by convection, as distinguished by conduction and radiation, and consequently by regulating the airflow through the outlet, the heat output and hence the room temperature can be correspondingly regulated.

In the invention, as well as in the prior art, regulation of the outlet airflow is accomplished by a movable damper. This damper is rotatable between an open limit position and a closed limit position to selectively regulate the airflow through the outlet. However, according to the improvement of the invention there are provided at least one, and preferably a plurality of apertures in the damper through which a limited outflow of air can pass when the damper is in its closed position, and which present less interference to air flow when the damper is open.

The damper of the invention can be easily removed and installed in the heat exchanger without servicing of pivot connections commonly used with prior art dampers. A plurality of brackets connected to the wall structure at locations spaced along the length thereof have projecting swivel members that are received between lip panels of the damper. There are a pair of lip panels that are spaced-apart to define a hollow damper having a longitudinally extending opening facing the interior of the wall structure. The lip panels are resilient and have surfaces contoured to receive and retain each swivel member in sliding contact engagement. To install or remove the damper it is merely required to spread its lip panels apart until they release from the swivel members on all brackets.

At least one of the lip panels is disposed so as to engage each bracket so as to limit the movement of damper and thereby establish the open and closed limit positions of the damper.

For a better understanding of the invention and its several applications and advantages, reference should be had to the following detailed description and accompanying drawing which exemplify a preferred embodiment of the invention.

BRIEF DESCRIPTION OF THE DRAWING

In the drawing:

FIG. 1 is a perspective view of a heat exchanger unit equipped with an improved damper constructed in ac-

cordance with a preferred embodiment of the invention.

FIG. 2 is an elevation section view of the heat exchanger unit shown in FIG. 1 as taken along line 2-2 therein.

DESCRIPTION OF A PREFERRED EMBODIMENT OF THE INVENTION

In FIGS. 1 and 2 there is illustrated a heat exchanger unit 10 of the type commonly referred to as a baseboard heater. Unit 10 has a hollow wall structure 11 formed by a front panel 12 hung upon and supported by brackets 13 and 14 that are in turn connected to a back panel 15 for support thereby. Panels 12 and 15 are positioned in spaced-apart relation to each other so as to define a longitudinally extending inlet 16 at the bottom or floor plane of unit 10, and a longitudinally extending outlet 17 located a distance above the inlet 16.

Within wall structure 11, there is positioned upon brackets 13 for support thereby, heat exchange surface means in the form of a length of finned tube 18. It should be understood that there are a plurality of brackets 13 connected to panel 12 at locations along the length of tube 18 and all brackets 13 are lined up to support tube 18 and panel 12 in the manner shown by FIG. 2. Hot water is commonly circulated through tube 18 for heat exchange with air entering through inlet 16 and exiting through outlet 17.

To selectively regulate the airflow through outlet 17 and thereby correspondingly regulate the heat output of unit 10, there is provided an elongated damper 19 that is supported from wall structure 11 in proximity to outlet 17 and is rotatably movable relative thereto between an open limit position as shown in full outline in FIG. 2, and a closed limit position as shown in phantom by FIG. 2.

Damper 19 has a pair of resilient spaced-apart elongated lip panels 20 and 21 that are connected to an elongated web 22 so as to define a hollow damper 19 having a longitudinally extending opening 23 facing the interior of wall structure 11.

On web 22 there are provided a plurality of lengthwise spaced-apart slot apertures 24 that allow a limited outflow of air therethrough when damper 19 is in its closed limit position. When damper 19 is open, the apertures 24 present less interference with the hot air flow than would result if damper 19 were not ventilated by apertures 24 and acted as an air-trapping pocket.

Just as there are provided a plurality of brackets 13 spaced along the length of finned tube 18, there are provided a plurality of brackets 14 spaced along the length of damper 19. Each bracket 14 has an arm 25 bearing at the end a swivel member 26, which is received between the lip panels 20 and 21 to rotatably support damper 19 at a corresponding location along its length. For such purpose, lip panels 20 and 21 have respective surfaces 27 and 28 contoured to receive and retain each swivel member 26 in sliding contact engagement. To install damper 19, or remove it, lip panels 20 and 21 merely are spread apart to allow surfaces 27 and 28 to be slipped over each swivel member 26.

Apart from the bracket 14 having a nose portion 31 over which front panel 12 is hooked, the bracket 14 has a portion 32 disposed to engage lip panel 20 to limit the damper 19 movement in the closing direction, and a

3

portion 33 disposed to engage lip panel 20 to limit the damper 19 movement in the opening direction. Thus, the portions 32 and 33 of bracket 14 establish respectively the open and closed limit positions of the damper 19.

From the foregoing description of a preferred embodiment, it can be appreciated by the artisan that the improved damper construction of the invention has many obvious applications and modifications to suit particular requirements, even though such variations are not specifically shown and described herein.

What is claimed is:

1. In a heat exchanger having a hollow wall structure defining an inlet and an outlet, heat exchange surface means positioned inside said wall structure for heat exchange with air entering through the inlet and exiting through the outlet, the improvement which comprises

4

an elongated damper having a pair of resilient elongated lip panels connected to an elongated web to define a hollow damper supported from said wall structure and rotatably moveable relative thereto between an open limit position and a closed limit position in which the damper engages said wall structure to substantially completely obstruct said outlet, and means defining a plurality of apertures in said web of the damper spaced-apart along the length thereof to allow a limited outflow of air therethrough when the damper is in said closed limit position, whereby said damper is operable to selectively regulate the airflow through said outlet between a maximum airflow when the damper is in said open limit position, and a minimum airflow established by said apertures when the damper is in said closed limit position.

* * * * *

20

25

30

35

40

45

50

55

60

65