

Oct. 3, 1933.

J. G. L. SKAR

1,928,798

VENTILATION CONTROLLING MEANS FOR LIBRARY STACKS AND LIKE STRUCTURES

Filed Dec. 18, 1931

4 Sheets-Sheet 1

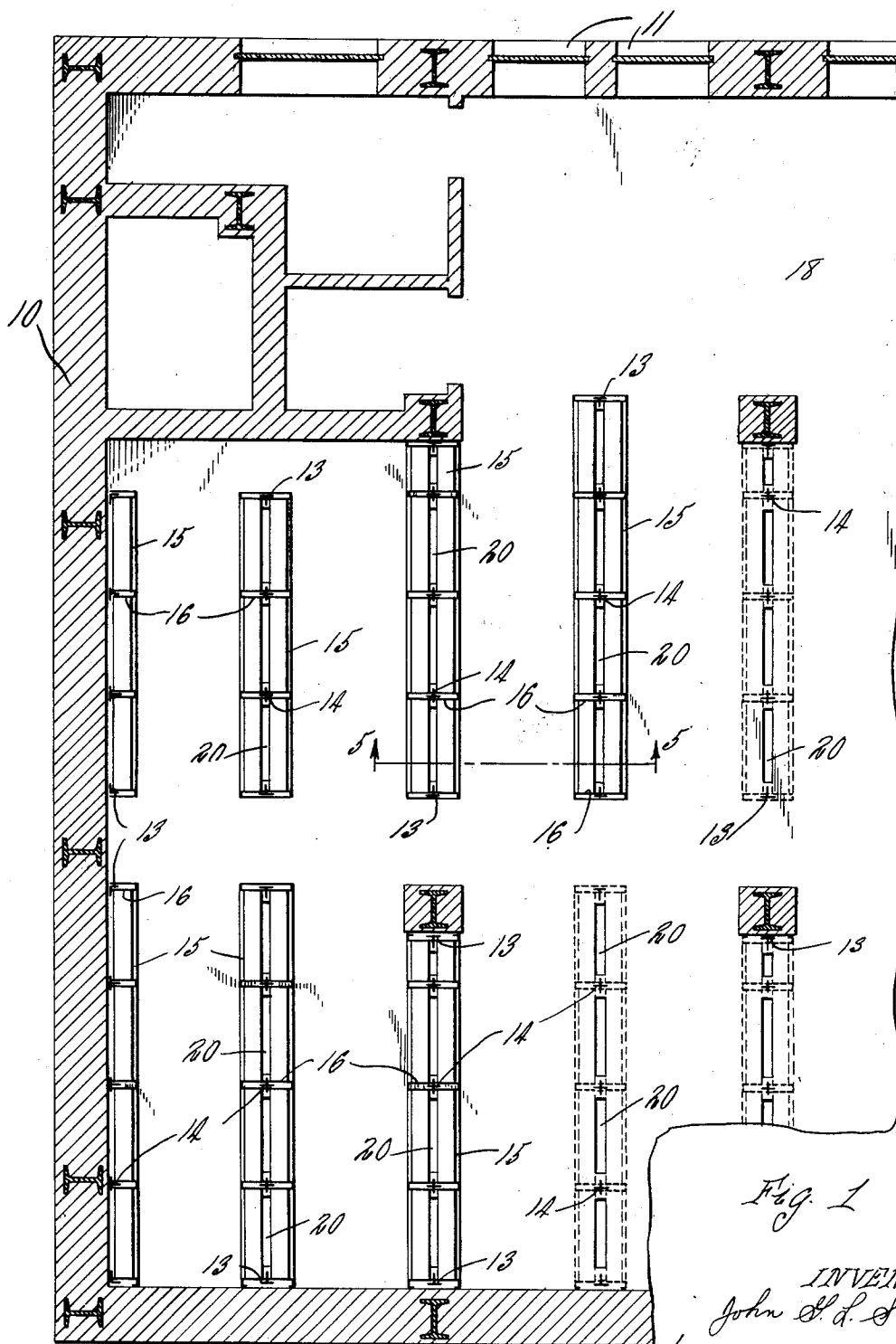


Fig. 1

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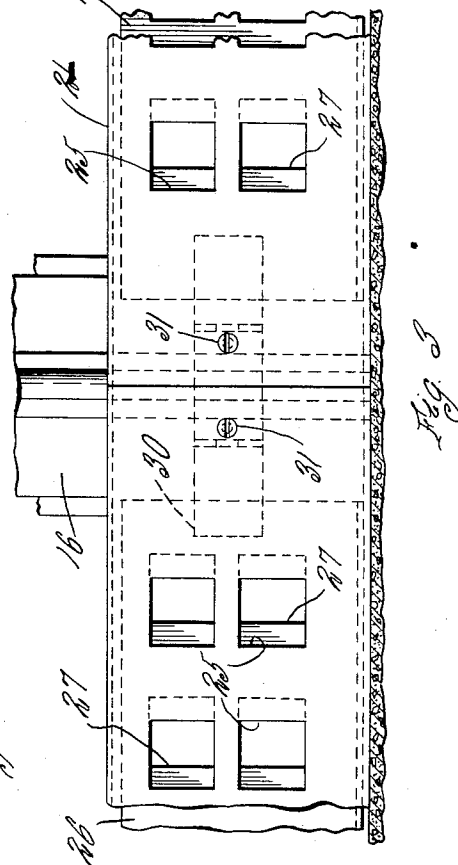
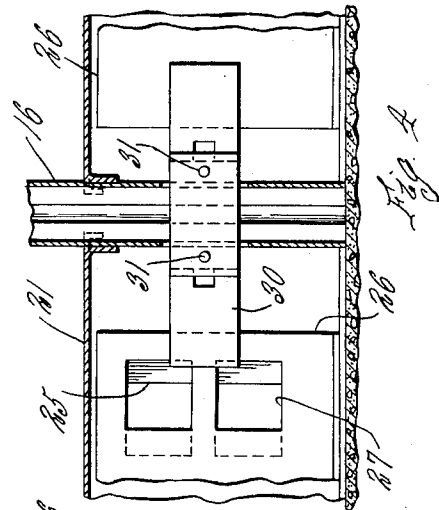
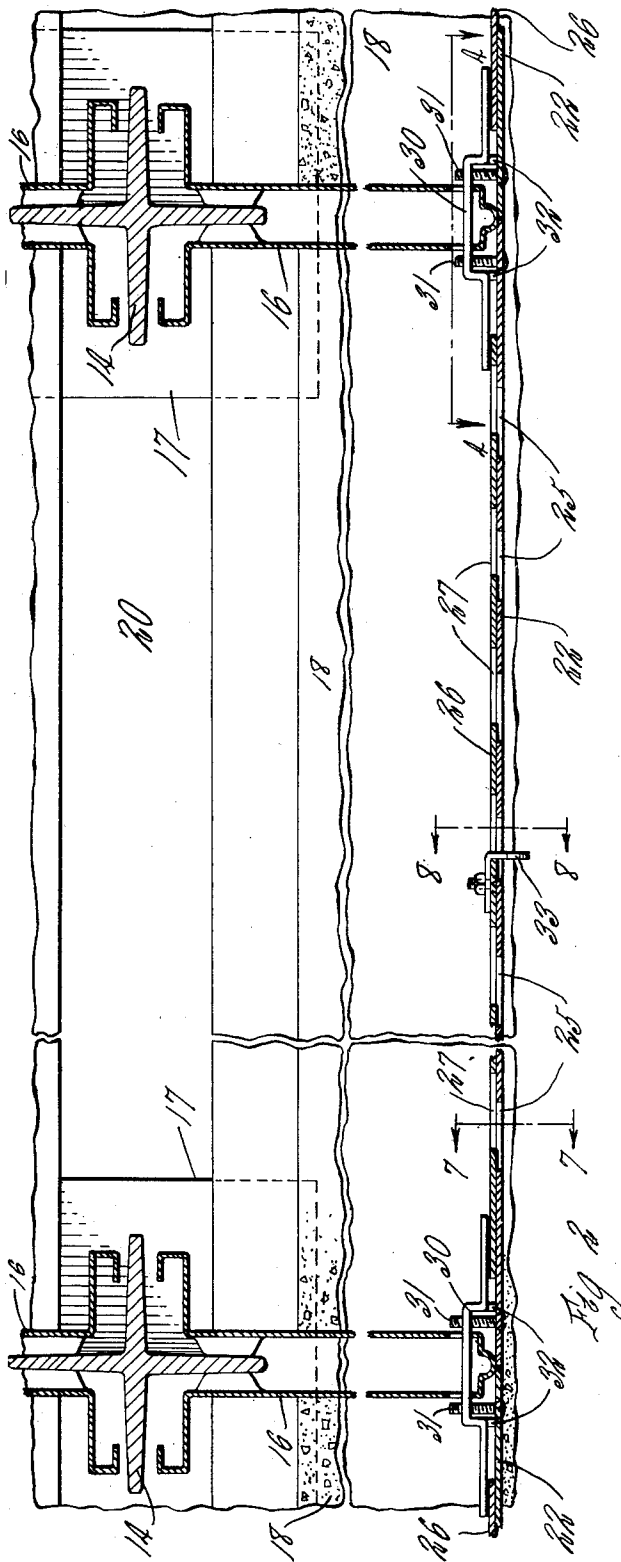
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4 Sheets-Sheet 2



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VENTILATION CONTROLLING MEANS FOR LIBRARY STACKS AND LIKE STRUCTURES

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4 Sheets-Sheet 3

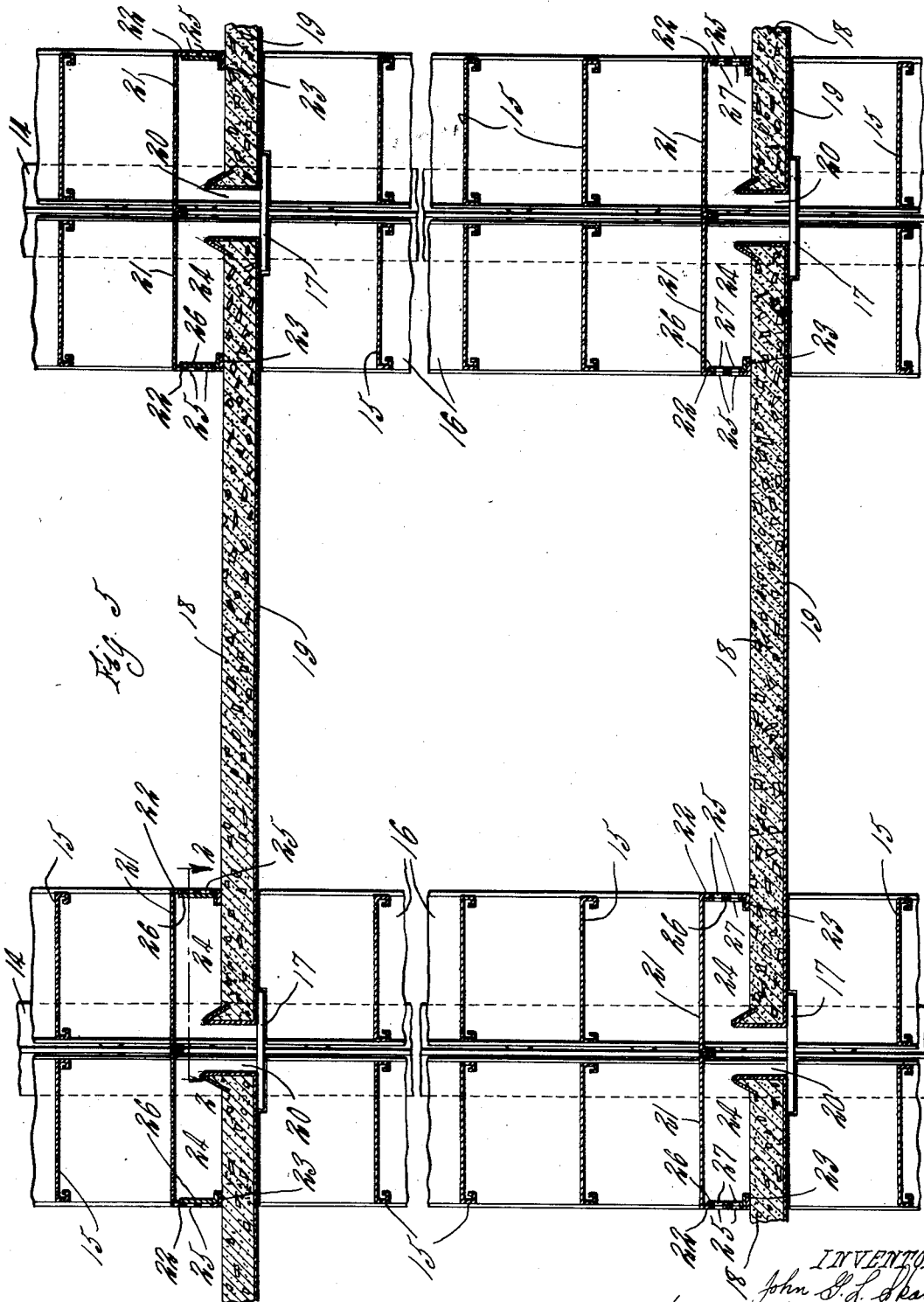


Fig. 5

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VENTILATION CONTROLLING MEANS FOR LIBRARY STACKS AND LIKE STRUCTURES

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4 Sheets-Sheet 4

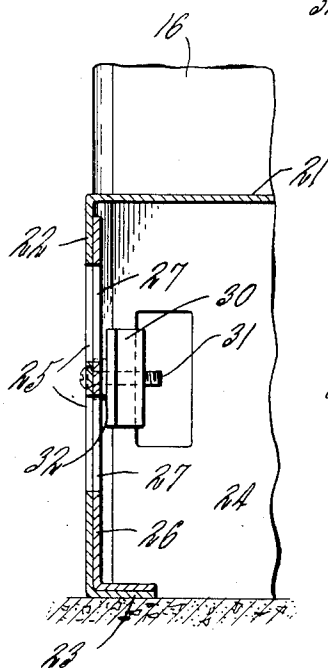
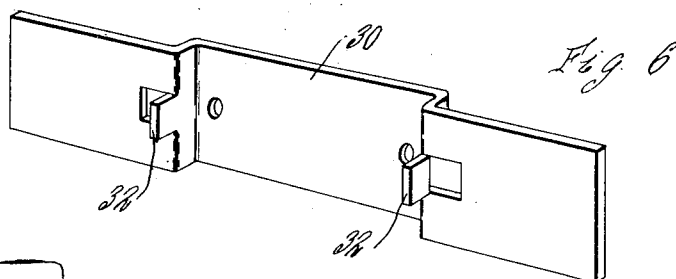


Fig. 7

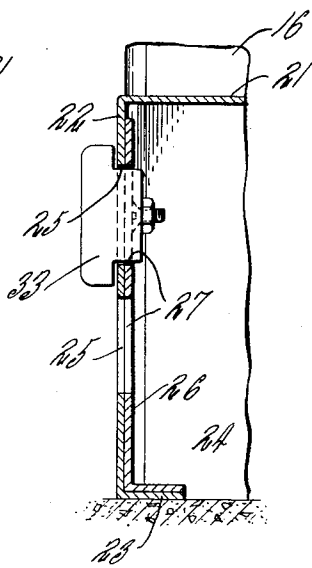


Fig. 8

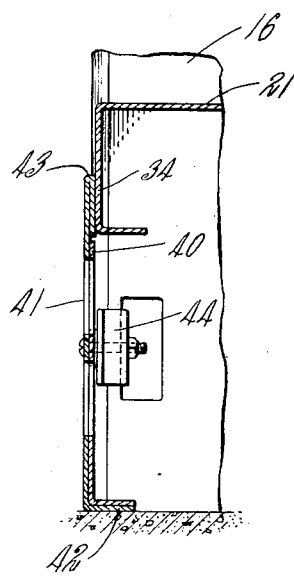


Fig. 9

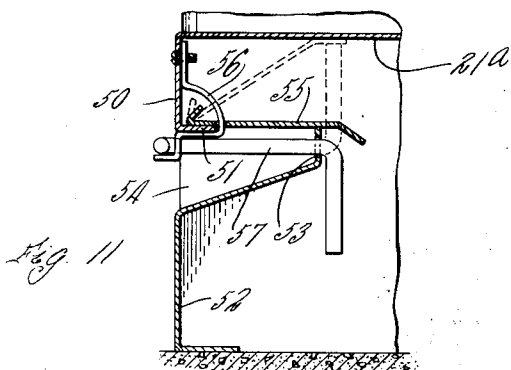
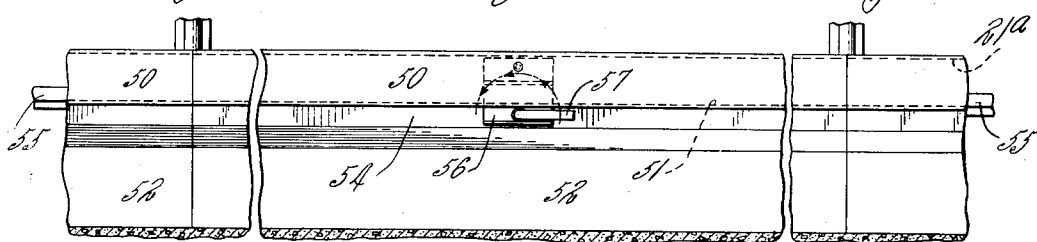


Fig. 11

Fig. 10

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UNITED STATES PATENT OFFICE

1,928,798

VENTILATION CONTROLLING MEANS FOR
LIBRARY STACKS AND LIKE STRUCTURESJohn G. L. Skar, Jamestown, N. Y., assignor to
Art Metal Construction Company, Jamestown,
N. Y.Application December 18, 1931
Serial No. 581,909

3 Claims. (Cl. 98—1)

This invention relates to means for controlling or regulating the ventilation in buildings or structures, such for example as libraries, which are equipped with bookstacks, racks or shelving disposed in ranges, with aisles between the racks to afford access thereto. In libraries, the bookstacks are commonly built several stories high, with the racks or shelving of one story or tier disposed vertically above or below the racks of the next story, and in such stacks, built in accordance with the present building practice, the racks or shelving of the different stories are supported by a skeleton metal framework or structure which extends the full height of the stack and also serves to support the floors or galleries which are disposed so as to divide the stack into different stories with floors at suitable levels to afford convenient access to the various racks or shelving.

In such structures these floors or galleries are commonly constructed or arranged so as to leave ventilation openings through the floors, one such known arrangement having the openings in each floor located beneath the racks or shelving on or above that floor. Said openings permit ventilation or the circulation of air through the floors into the aisles between the racks or shelving of the different stories. Because of the form or construction of the building or rooms in which the racks are located, and the disposition of the racks therein with reference to the windows or other openings, radiators or ventilators of the building, or possibly because of other conditions, the ventilation of the various different aisles of these stacks has not been uniform, some of the aisles being subject to excessive ventilation or draft, while in others the ventilation has not been adequate to obviate objectionable conditions or produce comfort to those using the rooms or aisles.

One object of this invention is to provide such stacks or structures with ventilation controlling means, whereby the circulation of air for heating, cooling or ventilating the aisles or rooms in which the racks are located may be controlled so as to insure a more nearly uniform ventilation of the various aisles, or so as to restrict the circulation of air through one or more aisles and increase it through another aisle or aisles, as may be desired for comfort or other reasons.

Other objects of the invention are to provide a library stack or analogous structure comprising racks arranged in different stories with means for regulating the circulation or movement of air, as may be desired, in different aisles or parts of the different stories of the structure; to produce such a structure in which the racks or shelving of the

different stories are arranged one above another and ventilators or regulators are provided at the bases of the racks for controlling, as may be desired, the ventilation through openings in the floors between the different stories of the structure; in which each of the several racks is provided at its base portion with a ventilation regulating means of simple and inexpensive construction; and to improve library stacks or analogous structures in the various respects hereinafter described and set forth in the claims.

In the accompanying drawings:

Fig. 1 is a fragmentary sectional plan of a building and stack structure equipped with ventilation regulating means employing the invention.

Fig. 2 is a sectional plan view, on an enlarged scale, through the base portion of one of the book-racks on line 2—2, Fig. 5.

Fig. 3 is a fragmentary, front elevation of the base portion of one of the bookracks.

Fig. 4 is a sectional elevation thereof on line 4—4, Fig. 2.

Fig. 5 is a fragmentary, sectional elevation on an enlarged scale on line 5—5, Fig. 1.

Fig. 6 is a perspective view, detached, of one of the attaching brackets for the ventilators.

Figs. 7 and 8 are sectional elevations on lines 7—7 and 8—8 respectively, Fig. 2.

Fig. 9 is a view similar to Fig. 7, of a slightly modified construction of the ventilator.

Figs. 10 and 11 are respectively a side elevation and vertical section illustrating another modification of the rack base and ventilator construction.

Referring to Fig. 1, 10 represents the walls of the library building or room in which the bookstack is housed, and 11 the window openings in one wall thereof. The bookstack, as shown, comprises a number of bookracks disposed in ranges or rows in each of several stories or tiers, and with the racks in one story arranged vertically over the racks in the next story below. Each book rack comprises end and intermediate upright supporting columns 13 and 14, and shelves 15 connected to and supported by upright sheet metal casings or members 16 which more or less enclose the columns 13 and 14 and in turn are secured to and directly supported by the upright columns. The columns 13 and 14 of the racks in one story are arranged vertically over the corresponding columns of the racks in the next story below, with the columns of the different stories rigidly connected to each other in a suitable manner, whereby the columns and their connecting elements form a skeleton rack-supporting

frame or structure extending the full height of the stack.

In the particular construction shown in the drawings to illustrate a practical embodiment of the invention, horizontal bearing plates 17 bear on and are secured to the upper ends of the columns 13 and 14 of each story, and the columns of the next story above rest at their lower ends on and are supported by the bearing plates 17. These bearing plates also serve to support the floors 18 which, as shown in Fig. 5, rest directly upon the bearing plates 17. Composite metal and concrete floors are shown consisting of a layer of concrete molded in and incorporated with shallow sheet metal forms 19. The stack structure thus briefly described may be constructed as more fully described and illustrated in the copending application of John G. L. Skar, Serial No. 563,521, filed Sept. 18, 1931, but this invention is concerned with the ventilation of such structures and not with the construction of the stack or the floors or the means for securing the floors in place per se, and these parts may be constructed and connected in any suitable manner. Preferably, however, the floors are formed or constructed so as to leave through each floor ventilation openings 20, each disposed beneath the base or bottom of a bookrack of the stack so that air can circulate from the space in one story of the structure through these openings to the next story.

The ventilators or regulators for controlling the circulation of air through these floor openings and through the aisles of the stack may be constructed in various ways. As shown in Figs. 2 to 8, they are constructed as follows:

The rack above each floor opening 20 is provided with a hollow base having a top or horizontal wall 21 which extends from end to end and side to side of the rack above and spaced from the underlying floor and over the opening 20 therein, and at each of the opposite sides of the rack the base has an upright wall 22 extending from the outer edge of the wall 21 down to the floor, this upright wall in the constructions shown, being provided at its lower edge with an intumed flange 23 which bears upon the top surface of the floor. The wall 21 and upright walls 22 extend between and connect the upright casing members 16 of each bookrack, and since the casing members 16 extend downwardly to the floor, the base walls 21 and 22, together with the casing members 16 form an air chamber 24 in the base of each rack which communicates with the ventilating opening 20 through the underlying floor, this chamber being closed at its ends by the end casing member 16 of the bookrack. These walls 21 and 22, as shown, are formed by sheet metal plates extending between the end and intermediate upright casing members of the rack. Each of the upright walls 22 is provided with openings 25 through which the air may pass to or from the chamber 24, and the openings 25 in the wall 22 between each two upright casing members 16 is controlled or adapted to be closed or opened to a greater or less extent by a damper or plate 26 arranged to slide against the inner face of the wall 22 and provided with openings 27 adapted to be placed in registration with the openings 25 in the plate 22. By adjusting the damper 26 so as to more or less open or close the openings 25 in the wall 22, the passage of air into or from the chamber 24 through the openings 25 may be controlled or regulated as desired.

As shown in the drawings, the plates forming the wall 22 are connected at their ends to the upright casing members 16 by attaching brackets 30 which extend horizontally through openings in the spaced walls of the casings 16, back of the plates 22, and screws 31 passing through holes in the ends of the plates 22 and screwed into threaded holes in the brackets 30. By tightening these screws, the brackets 30 and ends of the plates 22 are clamped securely in connection with the upright casing members 16. The brackets 30 are preferably formed with forwardly projecting lugs 32 which bear against the inner faces of the plates 22 and thus hold the opposite ends of the brackets spaced inwardly from the plates 22. The ends of the damper 26 are slidably confined between the inner face of the plate 22 and the ends of the brackets 30 at the opposite ends of the damper plate, the damper plate thus being guided in its sliding movements for placing its openings into or out of registration with the openings in the plate 22. An operating handle of any suitable sort can be provided for shifting the damper such, for instance, as the handle 33 shown in Figs. 2 and 8, which consists of an angle-plate having its inner arm bolted or otherwise secured to the damper plate and having its other arm projecting outwardly from the damper plate through one of the openings in the plate 22.

In the construction shown in Fig. 9, the base of the rack does not have a wall 22 extending down to the floor but the top wall 21 of the base has a depending side flange 34 which terminates above the floor, as clearly shown in Fig. 9. In this construction the ventilator is constructed so as to cover the space between the bottom edge of this depending flange 34 of the base plate and the floor, and the ventilator comprises a damper plate 40 and an outer upright cover plate 41 provided with a bottom flange 42 which rests upon the floor, and having its upper edge 43 bent backwardly and downwardly against the rear face of the plate, thus making the plate of double thickness at its upper edge. The down bent edge 43 bears against the front face of the depending flange 34 of the base plate of the rack. This cover plate may be secured against the front face of the flange of the base plate and against the casing members 16 by brackets 44 similar to the brackets 30, extending through holes in the spaced walls of the casing members 16, and secured by screws to the ventilator cover plate 41. The damper plate 40 may be slidably supported against the inner face of the ventilator plate 41 in the manner before described, that is by the sliding engagement of the ends of the damper between the inner face of the cover plate 41 and the ends of the brackets 44 which are spaced therefrom, as before explained.

It will be noted that by the described arrangement of the racks and ventilators, each rack which is located over one of the floor openings 20 is provided at its opposite sides that face the aisles between said rack and the opposing racks, with adjustable ventilators. By appropriate adjustment of these ventilators the circulation of the air through each aisle at opposite sides of the rack may be regulated as required, depending upon existing or desired conditions, and by appropriate adjustment of the ventilators in the aisles in different portions of the stack or rooms, the ventilation in such aisles or portions of the room may be controlled as may be necessary, to secure desired conditions and maximum comfort.

As shown in Figs. 10 and 11, the bottom shelf 21a of the rack, which may be considered as the top wall of the hollow rack base, has a depending vertical side flange 50 terminating above the floor and provided with an intumed bottom edge or flange 51, and below and spaced from this side flange is a base board or plate 52 having an inwardly extending upper portion with an upright top flange 53. The space between the base plate and the side flange 50 forms a ventilation opening 54 for the passage of air which is regulated by an adjustable damper 55, which extends across the opening 54 from the bottom edge of the side flange to the top edge of the base plate and is suitably hinged to the former as by a bent hinge plate 56 secured to the flange 50 and extending through a slot in the damper plate. When the damper is in the horizontal position shown by full lines in Fig. 11, it closes the ventilation opening, and it can be raised to permit the passage of air through the opening, as by a crank rod 57 adapted to turn in bearing holes in the hinge plate and top flange of the base plate. The crank rod has a crank arm at its inner end engaging the inner portion of the damper and a crank handle at its outer end, adapted in the open and closed positions of the damper, to rest on the out-turned bottom flange of the hinge plate 56. The damper can be readily opened and closed to control the passage of air through the opening by means of the crank rod.

I claim as my invention:

1. A rack comprising uprights, shelves extending between said uprights, a plate extending from one to another of said uprights and forming a wall of a chamber in the base of said rack, brackets securing said plate to said uprights, a damper plate slidably confined between said wall plate and said brackets and adapted to be adjusted to vary the size of ventilation openings in said wall plate.

2. A rack comprising uprights, shelves extending between said uprights, a plate extending from one to another of said uprights and forming a wall of a chamber in the base of said rack, brackets extending through holes in said uprights and attached to said plate for securing the plate to said uprights, said brackets having portions spaced from said plate, and a damper plate slidably confined between said wall plate and said spaced portions of the brackets.

3. A rack comprising uprights, shelves extending between said uprights, a plate extending from one to another of said uprights and forming a wall of a chamber in the base of said rack, brackets extending through holes in said uprights back of said plate and having ends extending parallel with said plate and lugs engaging the plate to hold said ends spaced from the plate, screws connecting said brackets and plate and clamping the latter against said uprights, and a damper plate slidably confined between said wall plate and said spaced ends of the brackets.

JOHN G. L. SKAR.

35	110
40	115
45	120
50	125
55	130
60	135
65	140
70	145
75	150