

PATENT SPECIFICATION (11)

1 541 061

1 541 061

- (21) Application No. 15512/76 (22) Filed 15 April 1976 (19)
 (31) Convention Application No. 50/055 865U (32) Filed 23 April 1975 in
 (33) Japan (JP)
 (44) Complete Specification published 21 Feb. 1979
 (51) INT. CL.² E04B 1/92
 (52) Index at acceptance
 E1W 136 3 CPW JCC



(54) SUSPENDED ANTI-SMOKE SCREEN AND METHOD OF CONSTRUCTING SAME

(71) I, KIYOTAKA MIYOSHI, a citizen of Japan, located at 2-38, 2-chome, Kamiya-cho, Hiroshima-shi, Hiroshima-ken, Japan, do hereby declare the invention, for which I pray that a patent may be granted to me, and the method by which it is to be performed, to be particularly described in and by the following statement:—

This invention relates to a suspended anti-smoke baffle or screen for use in a building, and to a method of constructing such a screen.

In the event of a fire in a building, the first must be prevented from spreading, and occupants, of the building or the people working there must be swiftly evacuated. For this purpose various fire extinguishers and fire alarms are available. The smoke generated by a fire quickly spreads along the ceiling and reaches far from the origin of the fire. On account of this phenomenon even the people who do not need to hasten their evacuation become disquieted so that they stampede, resulting in a disaster. To prevent such a calamity, anti-smoke screens have been devised to be suspended from the ceiling at intervals. Tests show that such suspended screens effectively prevent the smoke from spreading along the ceiling.

Suspended anti-smoke screens are mostly made of glass plates at the top of which holes are bored. Using the holes, the glass plates are hung from the ceiling. In other screens, opposed beads are provided within metal frames fitted near the ceiling, and glass plates are frictionally held between the beads. The former method of connecting the plates is relatively difficult to execute and is liable to break the glass; moreover, it spoils the appearance. In the latter method, the glass plates are pressed in; therefore this method excels in ease and rapidity of execution but gives a feeling of disquiet to people passing under the mounted glass plates.

An object of the invention is to provide an improved suspended anti-smoke screen and method of constructing such a screen.

According to one aspect of the invention,

there is provided a suspended anti-smoke baffle or screen comprising a channel bar attached to a ceiling of a building and having a downwardly opening slot therein which is exposed from the ceiling, at least one bolt hung through and extending downwardly from the slot in the channel bar, bearing means fixed to the lower end of the or each bolt, and a wall positioned between the slot in the channel bar and the bearing means so as to be suspended from the ceiling thereby.

According to another aspect of the invention, there is provided a method of constructing a suspended anti-smoke baffle or screen comprising attaching at least one metal bracket to a ceiling member of a building, bolting to the metal bracket or brackets a channel bar having a downwardly opening slot therein, hanging at least one downwardly-extending bolt through the slot in the channel bar, attaching a bearing member to the lower end of the or each bolt, and positioning at least one wall member between the slot in the channel bar and the bearing member or members so that the upper edge of the or each wall member is received in said slot and its lower edge is engaged with the respective bearing member.

According to a further aspect of the invention there is provided a suspended anti-smoke baffle or screen construction comprising a downwardly-opening channel member having horizontally elongated, downwardly extending side walls, connection means adapted to connect the channel member to a ceiling, and suspension means adapted to suspend an anti-smoke wall from the channel member with an upper portion of the wall received between the side walls of the channel member.

By means of the present invention, the channel bar or channel member is arranged parallel to the ceiling and the anti-smoke wall is easily and rapidly fitted thereto. The fitting needs no welding, and the position is freely variable along the channel bar or member with great convenience in many respects. Further, where the channel

bar or member spans several ceiling members, any of the ceiling members can be replaced without removing the channel bar or member.

5 The invention will now be described, by way of example, with reference to the accompanying drawings, in which:—

10 Figure 1 is a perspective view, partially cut away, of a suspended anti-smoke baffle or screen according to the invention;

Figure 2 is a front elevation, partially cut away, of the screen shown in Figure 1; and

15 Figure 3 is a sectional view taken along the line III—III in Figure 2.

Referring to the drawings, the anti-smoke baffle or screen comprises an elongate channel bar or member 1 having horizontally elongated downwardly extending side walls A¹¹, the external surfaces of these walls being formed with a plurality of ribs 3 which extend longitudinally of the channel bar 1. A horizontal portion extends between and interconnects the side walls A¹¹, and below this portion two shoulders A¹-1 and A¹-2 extend inwardly from the side walls A¹¹ respectively, their inner edges being mutually horizontally spaced so as to define a downwardly opening slot A¹ in the channel bar 1. Above the horizontal portion, two further shoulders A-1 and A-2 extend inwardly from upper edges of the side walls A¹¹ respectively, their inner edges being mutually horizontally spaced so as to define an upwardly opening slot A in the channel bar 1.

20 The channel bar 1 is connected to a ceiling of a room in a building in the following manner. One or more metal brackets 5 are attached to a beam C or a stiffener member B of the ceiling. In the illustrated arrangement, a plurality of brackets 5 are screwed firmly to several ceiling beams C (only one shown). Each bracket 5 has two flanges in each of which a slot 5a is provided.

25 A plurality of members 2a, which are each preliminarily bored and tapped with screw holes, are inserted into the upwardly opening slot A of the channel bar 1 so as to be slidable longitudinally thereof. A plurality of elongate bolts 4a are screwed into the screw holes in the members 2a, respectively and are secured to the brackets 5 by inserting each bolt 4a into the slot 5a in a respective one of the bracket flanges and by clamping the bracket flange between two nuts provided mid-way along the bolt. Each bolt 4a is fixed in this way mid-way along its respective slot 5a.

30 Ceiling panels D are held in position in a conventional manner, for example by some means fitted to the beams C or the stiffening members B, with their side edges bear-

ing against the ribbed outer surfaces of the channel bar slide walls A¹¹.

When the ceiling panels D have been installed, the downwardly opening slot A¹ in the channel bar 1 is exposed in the room. Anti-smoke wall members 6 are then suspended from the channel bar 1 in the following manner. One or more elongate bolts 4b (which are slightly longer than the height of the wall members 6) are firmly screwed into respective tapped members 2b which are slidable longitudinally of the channel bar 1 within the slot A¹. The upper edges of the wall members 6 are inserted between the side walls A¹¹ of the channel bar (the or each bolt 4b being positioned between adjacent lateral edges of a respective adjacent pair of the wall members 6), and lower edges of the wall members 6 are engaged with a bearing member 7 fixed to the lower end of the bolt 4b, the bearing member 7 being in the form of an upwardly opening channel which is medially supported on a head 8 of the bolt 4b. The gap left between the side walls A¹¹ of the channel bar 1 and the wall members 6 can then be padded with caulking or packing material, to retain the wall members 6 firmly in the channel bar 1.

35 The wall members 6 can be made of ordinary glass plate, wired glass plate or reinforced glass plate, for instance. When visibility is not a consideration, a metal plate or a slate board may be used instead, for example. The fact that the assembly of tapped member 2b, bolt 4b and bearing member 7 can be slid along the channel bar 1 enables the assembly to be moved up to the lateral edge of the appropriate wall member 6 depending on the width of the anti-smoke screen.

40 As shown in Figure 2, those wall members 6 which abut a wall of or a pillar are supported by a bracket 9 secured to the latter.

WHAT I CLAIM IS:—

1. A suspended anti-smoke baffle or screen comprising a channel bar attached to a ceiling of a building and having a downwardly opening slot therein which is exposed from the ceiling, at least one bolt hung through and extending downwardly from the slot in the channel bar, bearing means fixed to the lower end of the or each bolt, and a wall positioned between the slot in the channel bar and the bearing means so as to be suspended from the ceiling thereby.

2. A suspended anti-smoke screen as claimed in claim 1, wherein the or each bolt has secured to its upper end a member which is slidably inserted in the slot in the channel bar.

3. A suspended anti-smoke screen as claimed in claim 1 or 2, wherein the channel



bar or member spans several ceiling members, any of the ceiling members can be replaced without removing the channel bar or member.

- 5 The invention will now be described, by way of example, with reference to the accompanying drawings, in which:—

10 Figure 1 is a perspective view, partially cut away, of a suspended anti-smoke baffle or screen according to the invention;

Figure 2 is a front elevation, partially cut away, of the screen shown in Figure 1; and

15 Figure 3 is a sectional view taken along the line III—III in Figure 2.

Referring to the drawings, the anti-smoke baffle or screen comprises an elongate channel bar or member 1 having horizontally elongated downwardly extending side walls A^{11} , the external surfaces of these walls being formed with a plurality of ribs 3 which extend longitudinally of the channel bar 1. A horizontal portion extends between and interconnects the side walls A^{11} , and below this portion two shoulders A^{1-1} and A^{1-2} extend inwardly from the side walls A^{11} respectively, their inner edges being mutually horizontally spaced so as to define a downwardly opening slot A^1 in the channel bar 1. Above the horizontal portion, two further shoulders $A-1$ and $A-2$ extend inwardly from upper edges of the side walls A^{11} respectively, their inner edges being mutually horizontally spaced so as to define an upwardly opening slot A in the channel bar 1.

40 The channel bar 1 is connected to a ceiling of a room in a building in the following manner. One or more metal brackets 5 are attached to a beam C or a stiffener member B of the ceiling. In the illustrated arrangement, a plurality of brackets 5 are screwed firmly to several ceiling beams C (only one shown). Each bracket 5 has two flanges in each of which a slot 5a is provided.

50 A plurality of members 2a, which are each preliminary bored and tapped with screw holes, are inserted into the upwardly opening slot A of the channel bar 1 so as to be slidable longitudinally thereof. A plurality of elongate bolts 4a are screwed into the screw holes in the members 2a, respectively and are secured to the brackets 5 by inserting each bolt 4a into the slot 5a in a respective one of the bracket flanges and by clamping the bracket flange between two nuts provided mid-way along the bolt. Each bolt 4a is fixed in this way mid-way along its respective slot 5a.

60 Ceiling panels D are held in position in a conventional manner, for example by some means fitted to the beams C or the stiffening members B, with their side edges bear-

ing against the ribbed outer surfaces of the channel bar slide walls A^{11} .

When the ceiling panels D have been installed, the downwardly opening slot A^1 in the channel bar 1 is exposed in the room. Anti-smoke wall members 6 are then suspended from the channel bar 1 in the following manner. One or more elongate bolts 4b (which are slightly longer than the height of the wall members 6) are firmly screwed into respective tapped members 2b which are slidable longitudinally of the channel bar 1 within the slot A^1 . The upper edges of the wall members 6 are inserted between the side walls A^{11} of the channel bar (the or each bolt 4b being positioned between adjacent lateral edges of a respective adjacent pair of the wall members 6), and lower edges of the wall members 6 are engaged with a bearing member 7 fixed to the lower end of the bolt 4b, the bearing member 7 being in the form of an upwardly opening channel which is medially supported on a head 8 of the bolt 4b. The gap left between the side walls A^{11} of the channel bar 1 and the wall members 6 can then be padded with caulking or packing material, to retain the wall members 6 firmly in the channel bar 1.

The wall members 6 can be made of ordinary glass plate, wired glass plate or reinforced glass plate, for instance. When visibility is not a consideration, a metal plate or a slate board may be used instead, for example. The fact that the assembly of tapped member 2b, bolt 4b and bearing member 7 can be slid along the channel bar 1 enables the assembly to be moved up to the lateral edge of the appropriate wall member 6 depending on the width of the anti-smoke screen.

As shown in Figure 2, those wall members 6 which abut a wall or a pillar are supported by a bracket 9 secured to the latter.

WHAT I CLAIM IS:—

1. A suspended anti-smoke baffle or screen comprising a channel bar attached to a ceiling of a building and having a downwardly opening slot therein which is exposed from the ceiling, at least one bolt hung through and extending downwardly from the slot in the channel bar, bearing means fixed to the lower end of the or each bolt, and a wall positioned between the slot in the channel bar and the bearing means so as to be suspended from the ceiling thereby.

2. A suspended anti-smoke screen as claimed in claim 1, wherein the or each bolt has secured to its upper end a member which is slidably inserted in the slot in the channel bar.

3. A suspended anti-smoke screen as claimed in claim 1 or 2, wherein the channel



* C L M S *

bar is attached to the ceiling by means of a plurality of further bolts.

4. A suspended anti-smoke screen as claimed in claim 3, wherein the channel bar has an upwardly opening slot therein, in which are slidably inserted members fixed to the further bolts.

5. A method of constructing a suspended anti-smoke baffle or screen, comprising attaching at least one metal bracket to a ceiling member of a building, bolting to the metal bracket or brackets a channel bar having a downwardly opening slot therein, hanging at least one downwardly-extending bolt through the slot in the channel bar, attaching a bearing member to the lower end of the or each bolt, and positioning at least one wall member between the slot in the channel bar and the bearing member or members so that the upper edge of the or each wall member is received in said slot its lower edge is engaged with the respective bearing member.

6. A method as claimed in claim 5, wherein the lower edge of the or each wall member is engaged with the respective bearing member by moving the respective bolt up to a lateral edge of the wall member, depending on the length of the wall member.

7. A method as claimed in claim 5 or 6, wherein the channel bar is bolted to the metal bracket or brackets by connecting at least one further bolt to the or each bracket and to a respective tapped member which is slidable within an upwardly opening slot in the channel bar.

8. A method as claimed in claim 5, 6 or 7, wherein the or each first-mentioned bolt is hung through the downwardly opening slot in the channel bar by connecting said bolt to a respective tapped member which is slidable within said slot.

9. A method as claimed in any one of claims 5 to 8, further comprising padding a gap between side walls of the channel bar and the or each wall member.

10. A suspended anti-smoke baffle or screen construction comprising a downwardly-opening channel member having horizontally elongated, downwardly extending side walls, connection means adapted to connect the channel member to a ceiling, and suspension means adapted to suspend anti-smoke wall from the channel member with an upper portion of the wall received between the side walls of the channel member.

11. A construction as claimed in claim 10, wherein the channel member includes a horizontal portion extending between the side walls, and the suspension means comprises shoulders which extend inwardly from

the side walls respectively and whose inner edges are mutually horizontally spaced, thereby forming a downwardly opening slot in the channel member through which a supporting element or elements for the anti-smoke wall can be hung.

12. A construction as claimed in claim 11, wherein the or each supporting element comprises a member slidable within the downwardly-opening slot and having a tapped hole therein, an elongate bolt connected at one end to the slidable member for movement along said slot, and a bearing member connected to the other end of the bolt.

13. A construction as claimed in claim 12, wherein the bearing member of the or each supporting element is in the form of an upwardly-opening channel member which is medially supported on the head of the respective bolt.

14. A construction as claimed in claim 12 or 13 wherein the anti-smoke wall comprises a plurality of wall members, the bearing member of the or each supporting element being arranged to engage adjacent end portions of the lower edges of an adjacent pair of the wall members such that adjacent lateral edges of said wall members are positioned adjacent the bolt of said supporting element, the side walls of the channel members being arranged to receive upper edges of the wall members therebetween.

15. A construction as claimed in any one of claims 10 to 14, wherein the connection means comprises shoulders which extend inwardly from upper edges of the side walls respectively and whose inner edges are mutually horizontally spaced, thereby forming an upwardly opening slot in the channel member which receives a connection element or elements for connection to the ceiling.

16. A suspended anti-smoke baffle or screen substantially as hereinbefore described with reference to the accompanying drawings.

17. A method of constructing a suspended anti-smoke baffle or screen, substantially as hereinbefore described with reference to the accompanying drawings.

18. A suspended anti-smoke baffle or screen construction substantially as hereinbefore described with reference to the accompanying drawings.

MARKS & CLERK,
Alpha Tower,
ATV Centre,
Birmingham, B1 1TT.
Agents for the Applicant.