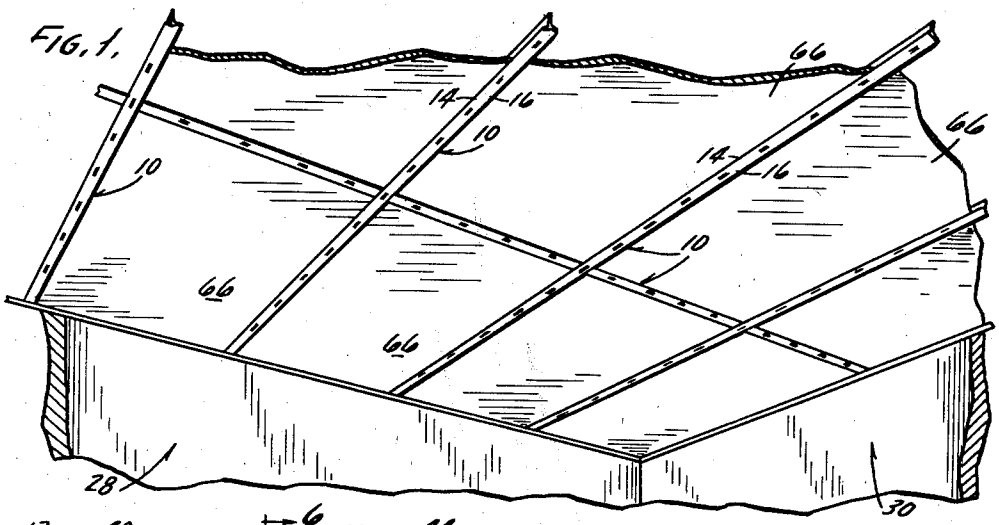
April 7, 1964 W. M. ERICSON 3,127,827

VENTILATED CEILING STRUCTURE USING PANEL-SUPPORTING T-RAILS WITH VALVE CONTROLLED SLOTS IN PAIRS FOR ADMITTING VENTILATING AIR

Filed March 26, 1962

FIG. 1.



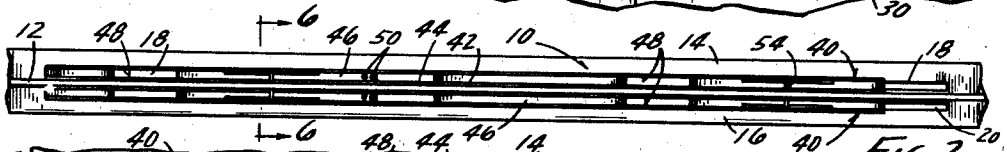


FIG. 2.

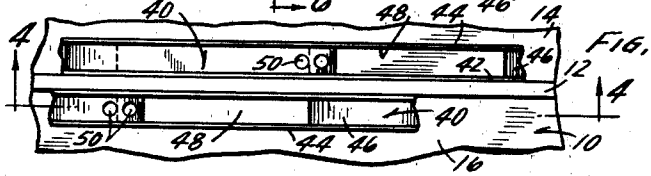


FIG. 3.

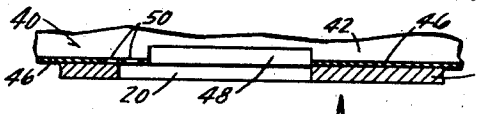
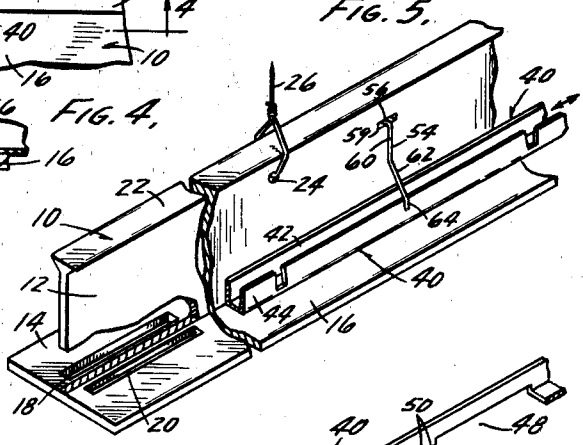


FIG. 4.

FIG. 5.



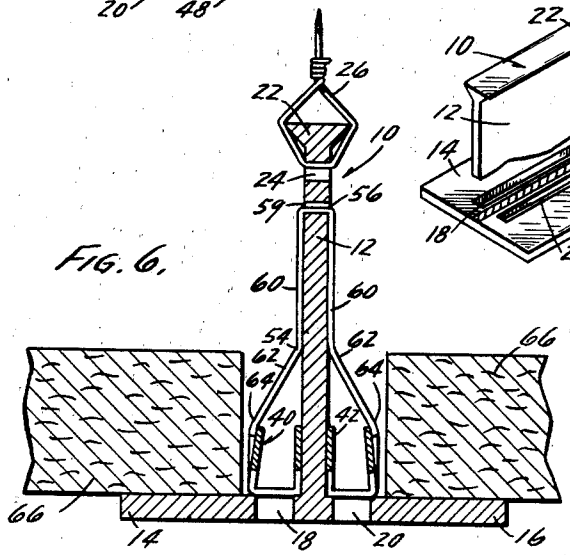


FIG. 6.

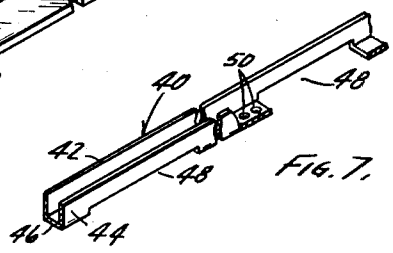


FIG. 7.

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United States Patent Office 3,127,827 Patented Apr. 7, 1964

3,127,827

VENTILATED CEILING STRUCTURE USING PANEL-SUPPORTING T-RAILS WITH VALVE CONTROLLED SLOTS IN PAIRS FOR ADMITTING VENTILATING AIR

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Filed Mar. 26, 1962, Ser. No. 182,435
8 Claims. (Cl. 98—40)

This invention relates to a ventilated ceiling structure using panel-supporting T-rails with valve controlled slots in pairs for admitting ventilating air.

For acoustical and other reasons, it is quite common to use rectangular panels in the construction of ceilings. For ventilation purposes, the panels are assembled as a false ceiling having a plenum chamber above it from which incoming air usually descends through slots in the ceiling. The present invention has to do with an arrangement in which the slots are provided in the supporting T-rails rather than in the ceiling panels and the slots are paired with one slot on each side of the standing rib of each T-rail.

The resulting performance as compared with the conventional slotting of a panel, or other forms of slotting of the panel supports, shows pronounced improvement.

In most ventilated ceiling structures, it is quite important from the standpoint of keeping the ceiling clean that each jet of air shall travel to a very substantial distance downwardly from the ceiling and then merge with other jets to make a descending blanket of air for the ventilation of the enclosed space. The distance that a jet of air travels through and from a slot is determined by the width of the slot. Yet in practice it is undesirable to use slots which are unduly wide, these being objectionable in appearance and otherwise.

It is found that two narrow slots side by side and in reasonably close proximity have substantially the same performance characteristics as a single slot equal in width to the combined width of the narrow slots. This is symmetrically achieved in an attractive manner by locating the slots at opposite sides of the standing rib of the T-rail which supports the ceiling panels. In practice, the combined width is nearly three-eighths of an inch and the distance to which the jet of air is projected is approximately one hundred times the width. When the jets issue from slots which are so closely related, the two jets merge a short distance below the ceiling with a travel substantially equal to that of a single slot of like total width. Both from the standpoint of appearance, however, and from the standpoint of control (the slots being individually valved), the result achieved by the present invention is outstanding.

In the drawings:

FIG. 1 is a fragmentary view in perspective looking up at a portion of the ceiling and portions of the adjacent walls of a room.

FIG. 2 is a fragmentary plan view on an enlarged scale of one of the T-rails shown in FIG. 1.

FIG. 3 is a fragmentary detail on a further enlarged scale showing a portion of the FIG. 2 structure in plan.

FIG. 4 is a view taken in section on the line 4—4 of FIG. 3.

FIG. 5 is a fragmentary detail view of a T-rail and valve assembly as viewed in perspective, portions being broken away.

FIG. 6 is a greatly enlarged view taken in cross section on the line 6—6 of FIG. 2 and with portions of the ceiling panels fragmentarily illustrated.

FIG. 7 is a fragmentary detail view of the slide valve illustrated in FIG. 5, portions being broken away.

Each of the T-rails **10** of the present invention preferably comprises an extrusion which includes an upstanding rib **12** provided at its lower end with laterally projecting flanges **14** and **16** having longitudinally spaced pairs of parallel narrow slots **18** and **20** respectively which are closely adjacent to but slightly spaced from the side surfaces of the central rib **12**.

The upper margin **22** of the central rib **12** of the T-rail is preferably widened as best shown in FIGS. 5 and 6 and the rib may be pierced by a transverse aperture **24** beneath the widened upper margin **22** to receive a tie **26** whereby the T-rail is suspended from the permanent ceiling or other conventional means of support (not shown).

A grid of rails such as that indicated in FIG. 1 is erected in known manner to extend from wall to wall, two walls being shown in FIG. 1 at **28** and **30**. For controlling the flow of air through the various slots **18** and **20** of the several T-rails, in order that a uniform distribution pattern may be maintained throughout the room, slide valves **40** are mounted on the flanges **14** and **16** of each T-rail. Each of these valves desirably takes the form of a channel of lightweight sheet metal having side flanges **42** and **44** connected at intervals by short bottom webs **46** between which the bottom end portions of the side flanges are removed to provide ports **48** which may be registered with the slots **18** and **20** of the T-rail and which are capable of receiving air laterally as well as downwardly through the open channel for delivery downwardly through the slot with which the port may register. There is sufficient length of bottom web **46** remaining in each slide valve to completely close the respective slot or slots **20** with which such bottom web registers. Also some portion of the bottom web is provided with a small opening or openings at **50** to receive a pointed instrument which may be thrust upwardly through one of the slots **20** of the T-rail to engage the bottom web **46** of the slide valve for the purpose of moving the slide valve longitudinally along the T-rail to adjust the valve web **46** for covering or exposing any desired portion of any given slot.

At **54** I have shown a clip which has a portion **56** passing through an aperture **59** in the upstanding rib of the T-rail. The legs **60** of the clip preferably are resilient and formed to engage the T-rail closely between them before they diverge at **62** in order that their terminal portions **64** may embrace the side flanges **42** and **44** of the respective slide valve channels. The engagement is preferably under sufficient bias so that these flanges may be deflected inwardly as best shown in FIG. 6 to hold the valve channels closely against the central rib and to anchor them frictionally against displacement from the position to which they have been adjusted.

With the valves in place on the respective T-rails, the ceiling panels **66** are mounted on the respective flanges **14** and **16** of the T-rails as clearly shown in FIG. 6. The margins of the panels are spaced sufficiently to accommodate free movement of the intervening slide valves along the T-rail. The slide valves and clips serve as spacers to preclude too close an approach of any panel margin to the central rib of the rail.

It will be evident that with this arrangement an operator charged with the duty of producing uniform distribution of ventilating air in the space beneath the false ceiling will be able to adjust the openings of both slots of each pair or of either slot of any pair between any requirement within the practical limits necessary in such a ceiling. Not only is the appearance good but the length of travel of the jet delivered through the combined slots if both are open will be approximately one hundred times the combined width of both slots.

I claim:

1. A ventilated ceiling construction comprising a plurality of ceiling panels arranged in side-by-side relation,

and a plurality of rails supporting said panels; each rail including an elongated rib disposed in spaced relation with respect to the marginal portion of an adjacent panel, a flange extending transversely from said rib, said flange having an outer portion engaging and supporting the marginal portion of said adjacent panel and an inner portion spaced from said panel marginal portion and provided with a plurality of ventilating openings, and valve means carried by said rail and slidably mounted on said flange inner portion to effect opening and closing of said ventilating openings.

2. A ventilated ceiling construction comprising a plurality of ceiling panels arranged in side-by-side relation, and a plurality of rails supporting said panels; each rail including an elongated rib disposed intermediate adjacent panels, a pair of flanges extending laterally in opposite directions from said rib and engaging said adjacent panels, one of said flanges having an outer portion engaging and supporting the panel marginal portion and an inner portion spaced from said panel marginal portion and provided with a plurality of ventilating openings, and valve means carried by said rail and slidably mounted on said flange inner portion to effect opening and closing of said ventilating openings.

3. The ventilated ceiling construction recited in claim 2 wherein both rail flanges have inner portions provided with a plurality of ventilating openings.

4. The ventilated ceiling construction recited in claim 1 wherein the elongated rib includes resilient means engaging said valve means and holding the latter in positive engagement with said flange inner portion.

5. The ventilated ceiling construction recited in claim 1 wherein the flange inner and outer portions are disposed in coplanar relation.

6. The ventilated ceiling construction recited in claim 1 wherein said valve means comprises an elongated channel shaped member having the web thereof in slidable contact with said flange inner portion and one of the legs thereof in slidable contact with said rib.

7. In a ventilated ceiling construction having a plurality of panels arranged in side-by-side relation, the invention which resides in the rails used for supporting such panels, each rail comprising a rib portion disposed in spaced relation to the marginal portion of an adjacent panel, a flange extending transversely from said rib, said flange including an outer portion engaging and supporting said adjacent panel marginal portion, and an inner portion adjacent said rib and spaced from the adjacent panel marginal portion and provided with a plurality of ventilating openings, and valve means carried by said rail and mounted for slidable movement on said flange inner portion to effect opening and closing of said ventilating openings.

8. The rail recited in claim 7 wherein said flange inner and outer portions are in coplanar relation.

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