Aug. 8, 1967 R. F. MORRISON 3,334,568

FITTINGS FOR ELECTRICAL FLUORESCENT-TUBE LAMPS

Filed Dec. 31, 1964 3 Sheets-Sheet 1

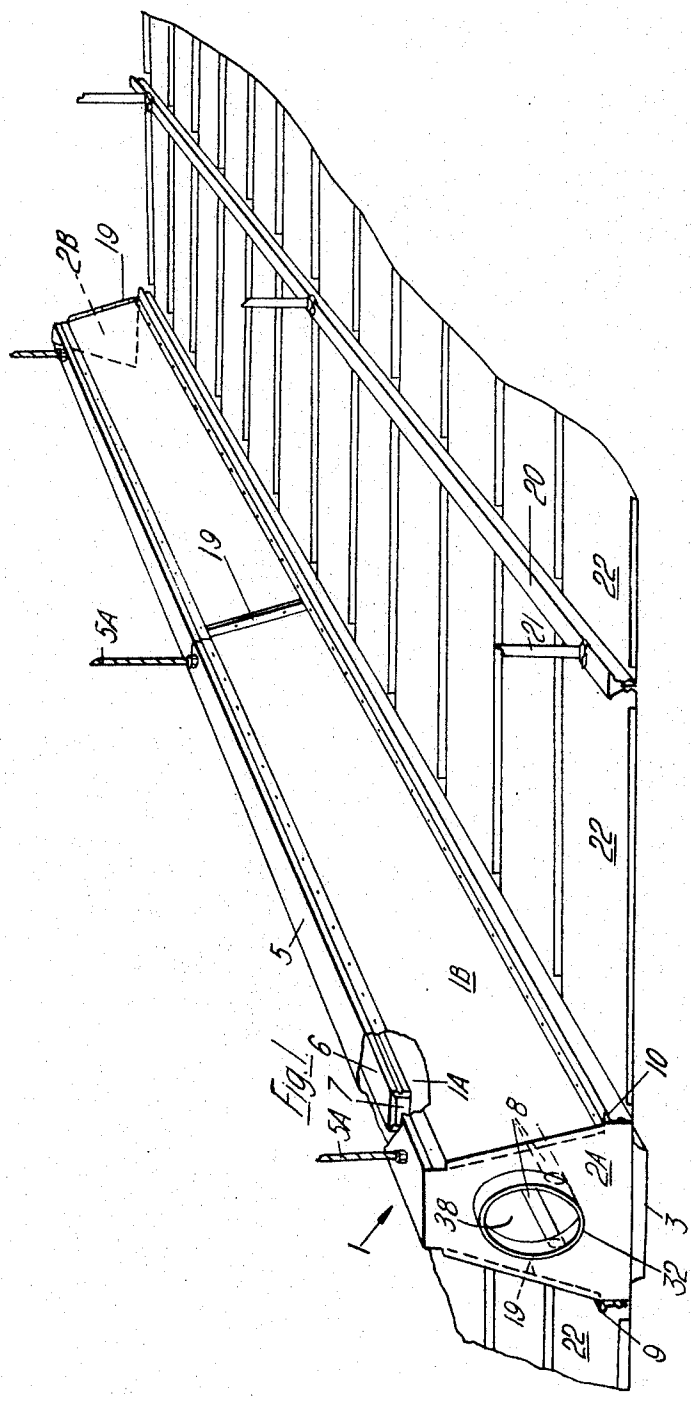


Fig. 1

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Fig.2

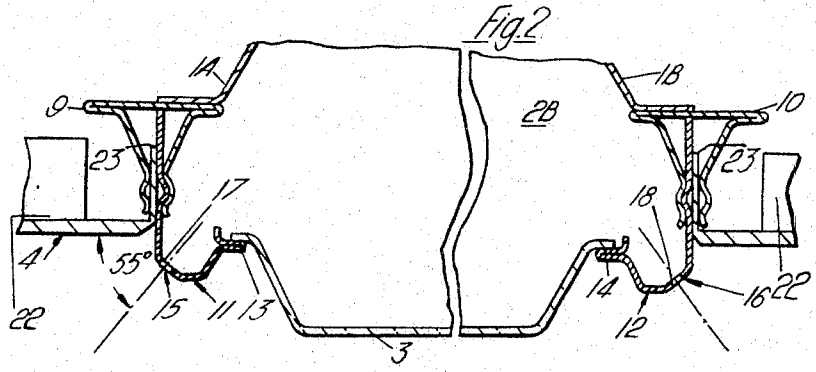


Fig.3

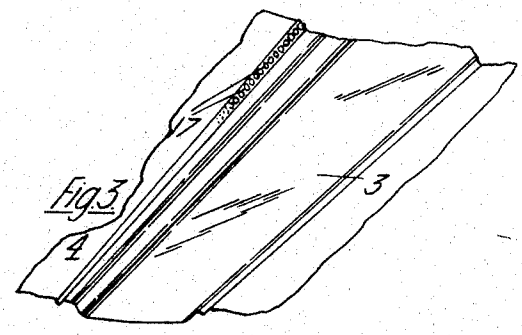
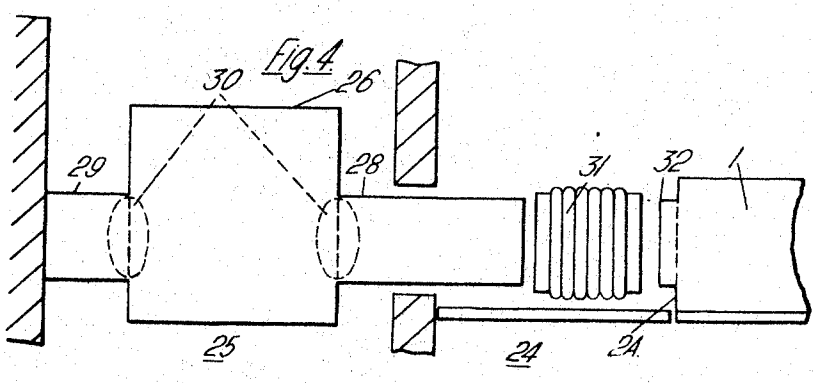


Fig.4



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Fig. 5

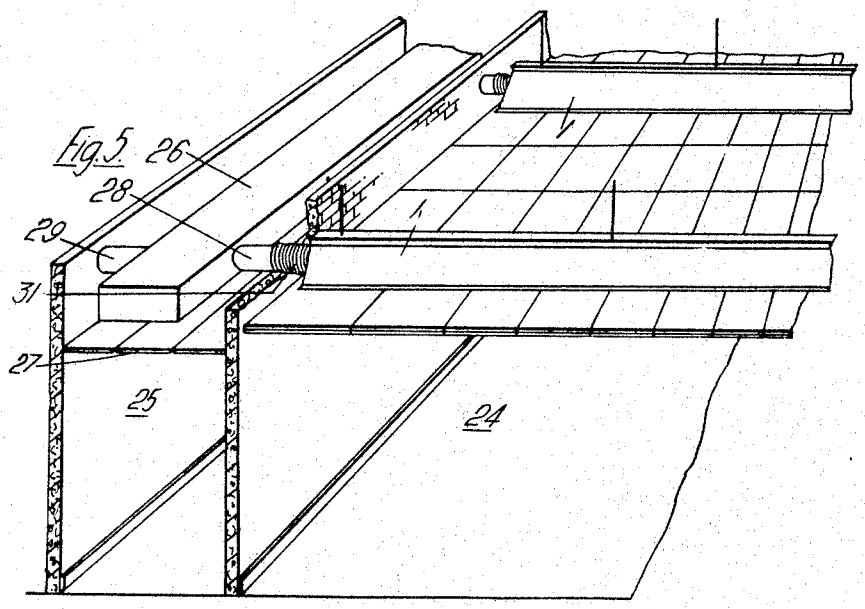
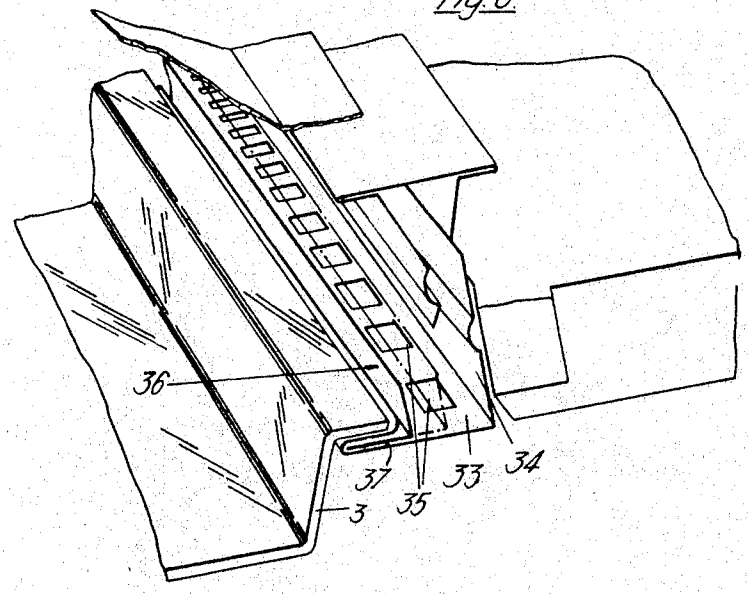


Fig. 6



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United States Patent Office 3,334,568 Patented Aug. 8, 1967

3,334,568

FITTINGS FOR ELECTRICAL FLUORESCENT-TUBE LAMPS

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Filed Dec. 31, 1964, Ser. No. 422,823
Claims priority, application Great Britain, Dec. 31, 1963, 51,313/63
1 Claim. (Cl. 98—40)

This invention relates to a fitting for electrical fluorescent lighting equipment including tubular lamps, the fitting being of the kind known as a troffer and consisting of an elongated casing of inverted-channel section for suspension with a suspended room ceiling and adapted to house and support the equipment, and a light-diffusing plate at the mouth of the casing.

In providing ventilation for rooms with suspended ceilings and suspended troffers it is usual to suspend an air duct behind the suspended ceiling and discharge air from the duct downwards into the room through distribution outlets in the ceiling. This system besides being expensive presents serious installation problems, and tends to be noisy, with poor air distribution.

Also, it has previously been proposed to provide an air inlet opening in the troffer casing intermediate the closed ends of the casing, and air outlet openings at the mouth of the casing, and to connect the air duct behind the ceiling with the inlet opening so that ventilating air enters the casing and flows downwards therefrom through the outlet openings into the room. Thus, the troffer serves as a combined light fitting and air distributor.

One object of the present invention is to provide a combined light fitting and air distributor from which air is discharged in a substantially constant velocity pattern along the entire length of the fitting.

Another object of the present invention is to provide a combined light fitting and air distributor which can be mounted in a room and supplied with air without the need for an air duct extending into the room.

Yet another object of the invention is to provide a combined light fitting and air distributor in which most of the heat produced by the fluorescent lighting equipment is absorbed by the ventilating air so that the operating efficiency of the lighting equipment is maintained.

An embodiment of the present invention will now be described by way of example, with reference to the accompanying diagrammatic drawing in which:

FIG. 1 is a top perspective view of a lighting troffer suspended with a room ceiling, parts being shown broken away.

FIG. 2 is an enlarged cross-sectional view of the bottom of the lighting troffer of FIG. 1.

FIG. 3 is an underneath perspective view of the lighting troffer of FIG. 1.

FIG. 4 is a fragmented side view showing a connection between the lighting troffer and a source of ventilating air.

FIG. 5 is a top perspective view further illustrating the ventilating system of FIG. 4.

FIG. 6 is a fragmentary transverse sectional view of an alternative form of lighting troffer.

Referring to the drawings:

A combined lighting and ventilating troffer suspended by rods with a suspended-tile room ceiling so as to form a recess in the ceiling, consists of an elongated casing of substantially inverted channel cross section with side walls 1A, 1B and end walls 2A and 2B and a dished light-diffusing closure plate or bottom wall 3 at the mouth of the casing and projecting from the ceiling surface 4 and serving as a bottom wall. The casing includes an

inverted channel-section ridge 5 suspended by rods 5A and to which is removably attached a carrier 6 which supports within the casing the electrical control gear box 7 and the fluorescent tubes or lamps 8. The downwardly diverging side walls 1A, 1B of the casing are secured at their upper ends to the side walls of the ridge 5 and have secured to their lower ends a pair of T-strip spring clips 9 and 10. A pair of channel-section strips 11 and 12 are carried by the respective clips 9 and 10, the outer walls of the channels engaging the clips, and the inner walls terminating in inwardly projecting ledges 13 and 14 which support the light-diffusing plate 3 while enabling removal and insertion thereof from below the ceiling. The carrier 6 is also inserted into the casing from below the ceiling. The bases of the channel strips 11 and 12 include downwardly and inwardly sloped portions 15 and 16 having therein series of circular perforations 17 and 18 from which air introduced into the troffer is discharged as jets directed laterally downwards and outwards at an angle of approximately 55° to the surface 4 of the ceiling. Thus, the troffer serves as both light fitting and air distributor. The variation in air discharge required from system to system is obtained by varying the diameter of the perforations. Also as the length of casing may vary from system to system, the casing length may be increased by joining several lengths end to end by connecting together abutting end flanges 19 on the side walls 1A, 1B. The suspended-tile ceiling consists of a framework of parallel T-strip spring clips 20 suspended by rods 21, and flanged ceiling tiles 22 with their flanges 23 sprung into the spring clips 20 of the framework and into the spring clips 9, 10 of the lighting troffer.

Referring to FIGS. 4 and 5, the room 24 is ventilated by using the combined lighting and air-distributing troffers as air ducts within the room. Thus, in ventilatng large rooms openng from a corridor 25, a master air duct 26 extending along the corridor 25, above the corridor ceiling 27 has damper-controlled stub air ducts 28 and 29 opening laterally therefrom and extending through the corridor walls to feed rooms at both sides of the corridor. The dampers are indicated at 30 (FIG. 4). The troffers in the rooms are arranged to form continuations of said stub ducts 28, 29 the troffer end walls 2A and 2B lying closely adjacent to the room walls which they face, and being connected to the stub ducts by flexible sleeves coupling 31 engaging over external circular ends of the stub ducts and over the flanges 32 surrounding circular air-inlet openings 38 in the end walls. The troffer at each duct is composed of several lengths joined end-to-end.

In the modification shown in FIG. 6, the light-diffusing plate 3 of each troffer rests solely on the inner portions of ledges 33 formed by the horizontal limbs of angle-section strips 34, the outer portions of the ledges 33 being formed with series of rectangular openings 35 through which air passes vertically downwards into the room. Angle-section damper strips 36, are mounted on the ledges 33 being slidable laterally on the ledges to vary the area of the openings 35 in accordance with the air flow desired. The upright limbs of the damper strips 36 are manually grippable to effect damper adjustment while the horizontal limbs of the damper slidingly engage in horizontal slots 37 formed in the inner portions of the ledges 33 by doubling back the ledges.

In use of the ventilating system, the troffers operate in the usual way as flourescent light fittings. Filtered ventilating air passes from the stub ducts 28, 29 into the casings 1 of the light troffers, and from the casing 1 into the room, the air penetration into the room being substantailly uniform over the entire length of each

casing. Each troffer thus serves as both duct and distributor, the distribution being spread over a maximum area and issuing at a substantailly constant velocity along the entire length of the troffer.

In addition to providing for room ventilation at virtually no extra trouble and expense, the ventilating system of the invention also has a substantial cooling effect on the fluorescent tubes and control gear, which means almost doubling the life of the electrical equipment and adding about 10% to the light output for the same consumption of current. This feature is of particular importance in rooms requiring very high illumination.

Also, by virtue of the invention, erection of the ventilating system is accelerated and simplified, as the problems raised by having men of three or four different trades working simultaneously in one location do not arise and work on the different parts progresses naturally.

It will be appreciated that the invention is also applicable to warm air heating and to air conditioning.

It will also be appreciated that various modifications may be made in the above-described system. Thus, the troffer and ceiling may be suspended by any suitable means other than rods; the light-diffusing plate may be flat instead of dished; the suspended-ceiling system may be of any other suitable type, using tiles made from mineral fibre, organic fibre, asbestos compounds, metal or any other suitable material; and the troffer may be of any other construction suitable for serving as an air duct.

I claim:

A lighting and ventilating system for a room, comprising an elongated inverted channel-shaped casing

mounted within the room and adapted to house electrical fluorescent lighting equipment including a tubular fluorescent lamp, said casing including a pair of side walls, a pair of end walls and a light-diffusing bottom wall, an end wall of said casing lying closely adjacent to a room wall so that the casing extends longitudinally and perpendicularly from said room wall, said end of the casing having a through opening therein, an annular flange on the exterior of said end wall and surrounding the through opening, an air duct outside the room and extending transversely of the casing, and parallel to the room, a stub duct branching laterally from the air duct and penetrating said room wall, a coupling between the inner end of the stub duct and the annular flange on the casing whereby the air flows from the duct into the casing in the general direction of the longitudinal dimension of the casing and longitudinally over the fluorescent lamp to fill the space housing the lighting equipment and cool the lamp, and air outlet means at the bottom of the casing to permit escape of air from the casing into the room.

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