May 23, 1967 D. APOUCHTINE 3,320,868

OUTLET GRILL FOR AIR DUCTS

Filed May 17, 1965 2 Sheets-Sheet 1

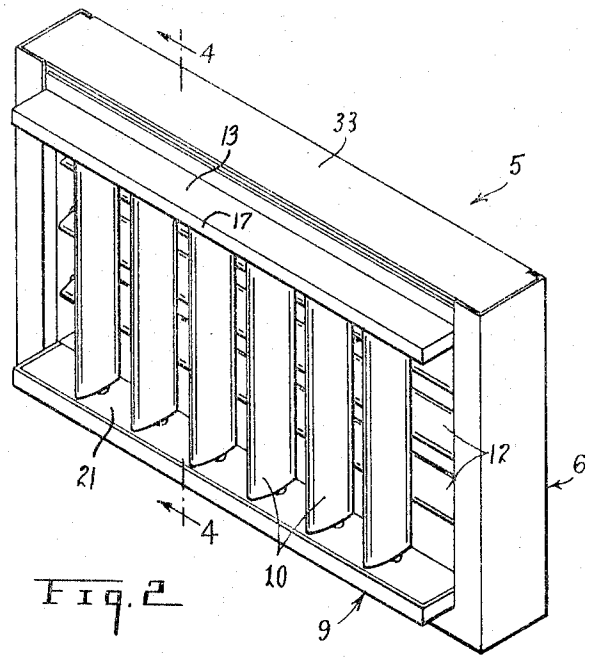

Fig. 2

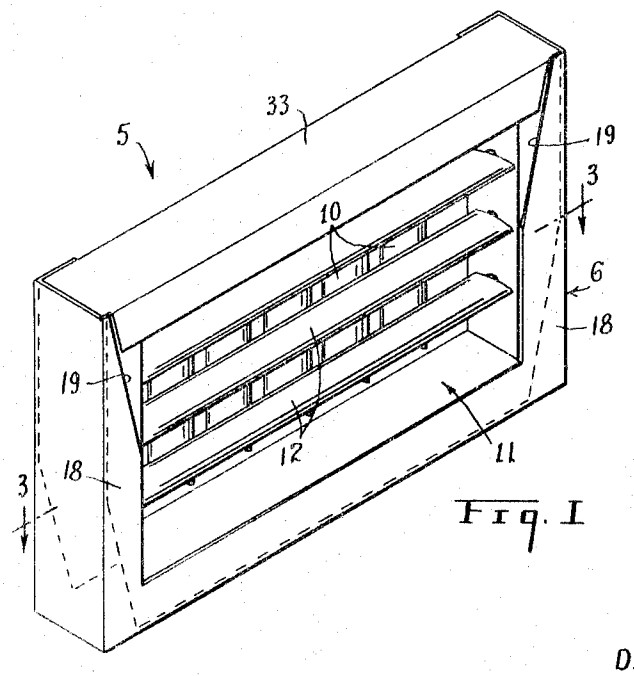

Fig. 1

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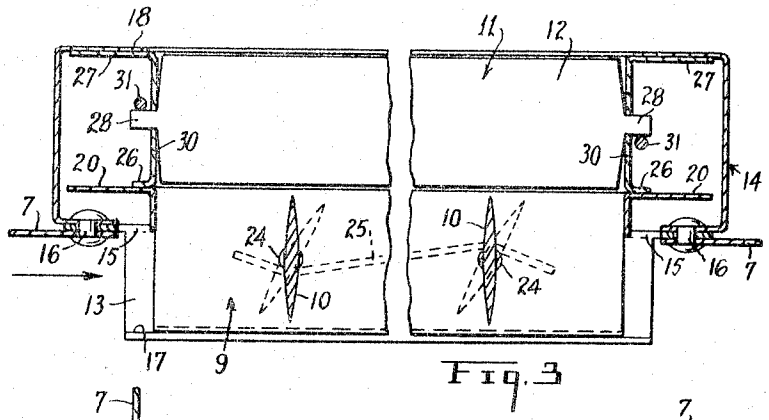

Fig. 3

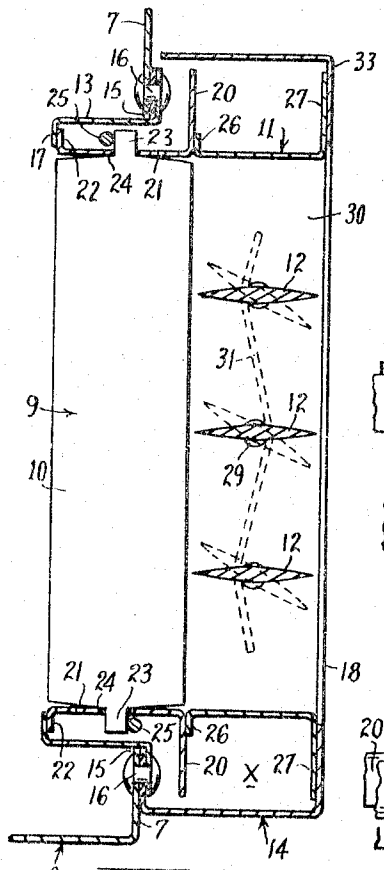

Fig. 4

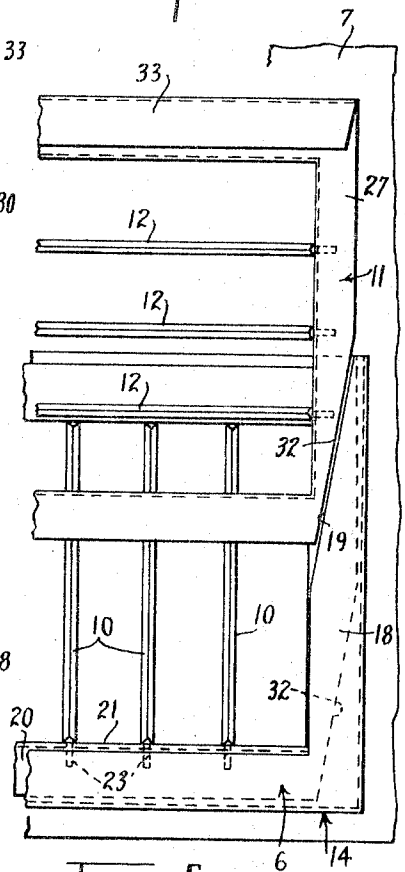

Fig. 5

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3,320,868

OUTLET GRILL FOR AIR DUCTS

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This invention relates to outlet grills for air ducts in air distribution systems.

It has been the practice to fit air outlet grills on the outer surface of air ducts at suitable locations and to provide such grills with louvres for directing the air to certain designated locations in a building. These louvred grills pick up a surface deposit of lint and dust and must be cleaned often in order to maintain efficiency of air distribution. Furthermore an efficient cleaning job cannot be done on grills secured to the duct by fasteners unless the grills are removed. This operation takes considerable time and is costly. In addition such grills are usually located on the side of ducts hanging from the ceiling. Such ducts and outlet grills must be very well secured to prevent a piece falling on machines below where they could cause costly damage.

The present invention consists essentially of a channel shaped U housing permanently secured about an opening in the side of an air duct and a pair of removable cores fitted into the U shaped housing, one core being located inwardly of the side wall of the duct and having vertically disposed louvres located in the path of the air flowing through the duct, the louvres being adjustable to divert some of the air outwardly through the opening in the side of the duct. The second of the pair of cores being located in front of the first mentioned core and having horizontally disposed louvres adjustable to divert the air passing through the first core to a downwardly direction into the building. The channel shaped U housing has the inner facing edge of its vertical side walls cut at an angle to provide a wider opening at the top of the front face of the frame. The pair of cores have the lower portion of their vertical side members cut at an angle to permit the cores to be inserted into the U shaped housing when the cores overlap approximately half of the U frame permitting the cores to be fitted into the U shaped housing closer to the ceiling. This is of great advantage when the air ducts are relatively shallow and head room is limited.

The object of the invention is to provide instantly removable louvre cores in an air outlet grill for fast cleaning.

A further object of the invention is to provide removable louvre cores which can be fitted into a receiving frame with a minimum of head room.

A further object of the invention is to provide removable louvre cores which are securely held in place without the use of screws, springs, rivets, levers or other mechanism involved in removing the cores for cleaning.

A further object of the invention is to provide a louvred core which, when in place, will be located in the path of air flowing through an air duct and will divert a portion of that air through an opening in the side of the duct.

A further object of the invention is to provide a pair of core members in an air outlet grill whereby air is first diverted outwards through the side of an air duct and then diverted downwards outside of the duct.

These and other objects of the invention will be apparent from the following detailed specification and the accompanying drawings, in which:

FIG. 1 is a perspective front elevation of the air outlet grill according to the present invention.

FIG. 2 is a perspective rear elevation of the air outlet grill shown in FIG. 1.

FIG. 3 is an enlarged partial horizontal section of the grill taken on the line 3—3 of FIG. 1, showing the grill mounted in an opening in the side wall of an air duct.

FIG. 4 is an enlarged vertical section taken on the line 4—4 of FIG. 2.

FIG. 5 is a partial vertical front elevation of the grill showing the front core member partially elevated in its supporting frame for removal within a minimum of head room.

Referring to the drawings, the air outlet grill **5** consists of a supporting housing **6** mounted on a side wall **7** of an air duct **8**, an inner core **9** having vertical louvres **10** and an outer core **11** having horizontal louvres **12**.

The supporting housing **6** consists of an inner rectangular frame **13** and a channel U frame **14** both secured about an opening **15** in the side wall **7** of the air duct **8** by means of the rivets **16**. The inner frame **13** projects into the air duct **8** and has its inner horizontal edges flanged to form a pair of stops **17** against which the inner core **9** abuts. The outer U frame **14** is of channel section whose front vertical walls **18** have their top portion cut back at an angle at **19** for a purpose which will be explained later.

The inner and outer cores **9** and **11** have a combined horizontal width transversely of the housing **6** just slightly less than the width between the opposing faces of the stops **17** on the frame **13** and the front walls **18** of the frame **14**.

The inner core **9** consists of a rectangular frame having a front facing flange **20** and top and bottom horizontal members **21** whose rear edges are flanged at **22** to abut against the stops **17** of the frame **13**. A series of vertically disposed louvres **10** preferably of aerodynamic section have their end pintles **23** sealed in apertures **24** in the horizontal members **21**. These louvres **10** are adjustable about vertical axes and are held in their adjusted position by springs **25** in well known manner.

The outer core **11** consists of a channel sectioned rectangular frame whose inner facing surface **26** abuts against the adjacent surface **20** of the core **9** and whose outer facing surface **27** abuts against the adjacent inner facing surface of the front walls **18** of the frame **14**. A series of horizontally disposed louvres **12** preferably of aerodynamic sections have their end pintles **28** seated in apertures **29** in the vertical walls **30** of the core **11**. These louvres **12** are adjustable about horizontal axes and are held in their adjusted position by springs **31** in well known manner.

The vertical side flanges **20** of the core **9** and the vertical side flanges **27** of the core **11** have their lower portions cut back at an angle at **31** and **32** respectively as shown in FIG. 5. The angle of the cut backs **31** and **32** are complementary to the angle of cut back **19** of the frame **6**, thereby permitting both cores **9** and **11** to be inserted into and withdrawn from the frame **6** at a lower vertical height than would be possible if these members were not cut back.

A cover member **33** is secured either permanently or by means of fasteners to the top of the front core member **11** and extends rearwardly to cover that portion of the rear core member **9** which extends outwardly of the front face of the side wall **7** of the air duct **8**.

In the application of the above described invention to an air duct, the housing **6** including the frames **13** and **14** are secured about the opening **15** in the wall, preferably the side wall of an air duct in the manner shown in FIGS. 3 and 4 with the open side of the U frame **14** at the top. The inner core **9** is now aligned in front of the housing **6** with the angled cut back edges **31** positioned at an elevation which will allow the core to pass inwardly into the housing **6** past the angled cut back edges **19** of the side members **18** of the U shaped frame **14**.

Having passed inwardly of the side members **18**, the core can now be lowered until it is aligned with the opening **15** in the side wall of the duct as defined by the frame **13**. The core is then pushed inwardly in the frame **13** until it meets the stops **17**. In a similar manner the outer core **11** is fitted into the housing **6**. The space available for the core **11** is defined by the opposing faces of the front wall **18** of the frame **14** and the flanges **20** of the inner core **9**. When the two cores **9** and **11** are in place within the housing **6** there is little or no slack between them and the contacting surfaces of the housing. The weight of the core **11** is sufficient to hold it in position in front of the core **9**.

The louvres **10** are positioned in the path of air flowing through the duct **8** and are adjusted about a vertical axis to divert a desired volume of air from the duct outwardly through the core **11**. The air is then diverted either downwardly or upwardly by the louvres **12** which are adjustable about a horizontal axis.

While a particular construction of the various elements has been illustrated and described, it will be realized that these elements can be constructed in various other ways to perform the same functions without departing from the spirit of the invention. For instance, it may be found advisable to set the inner core at an angle within the air duct to provide a deeper scooping effect on the air passing through the duct or the width of the louvres **10** may be graduated to accomplish this same effect.

Due to the U shaped arrangement of the frames all possible roughness inside as well as outside are concealed in a box-like manner, thus further reducing spots of accumulation of dust or lint.

Furthermore, should any rivets **16** or springs **25** or anything else get loose, break or detach from position, it will remain captive in the box-like space X (FIG. 4) and thus save the equipment or material in the room from being damaged. These features are in addition to neatness of appearance.

As will be seen in FIG. 5 a considerable saving in head room is achieved by use of the cut-backs in the frame **14** and cores. The cores can be removed quickly without the use of tools or removing fasteners, thereby permitting the complete grill to be thoroughly cleaned individually in a manner which cannot be achieved when the grill is a fixture in the wall of the air duct.

What I claim is:

1. A distribution grill for air ducts comprising a housing defining an air outlet to said duct, the said housing having a front U shaped frame, an inner louvred core

and an outer louvred core, the louvres of one core being disposed in planes at right angles to the plane of the louvres in the other of said cores, the said inner and outer cores have lower side portions thereof cut at an angle and the said U shaped frame has upper side portions cut at an angle complementary to the angle cut of the said cores permitting the said cores to be withdrawn from the said U shaped frame at approximately half the vertical height thereof, the said cores adapted to be positioned in face to face relationship within the said housing and being individually insertable and withdrawable from the said housing through the open end portion of the said U shaped frame.

2. A distribution grill as set forth in claim **1** in which the said housing has an inner rectangular frame portion to receive and support the said inner louvred core, and the said front U shaped frame is of channel section.

3. A distribution grill as set forth in claim **2** in which the said outer louvred core is seated in the said front U shaped frame and hold the said inner louvred core within the said inner rectangular frame.

4. A distribution grill as set forth in claim **1** in which the louvres of the said inner louvred core are located within the said duct and are set to divert a portion of the air flowing through the duct into and through the said inner and outer cores.

5. A distribution grill as set forth in claim **1** in which the louvres of the said inner core are disposed vertically and the louvres of the said outer louvred core are disposed horizontally, and the said louvres are individually adjustable about their vertical and horizontal axes.

6. A distribution grill as set forth in claim **2** in which the said outer U shaped frame portion of the housing is positioned on an outer facing surface of one wall of the air duct and the inner rectangular frame portion is projected inwardly of the said wall of the duct.

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