July 15, 1952 L. R. PHILLIPS ET AL 2,603,141

AIR OUTLET DEVICE FOR VENTILATING APPARATUS

Filed Dec. 16, 1949 2 SHEETS—SHEET 1

Fig. 1.

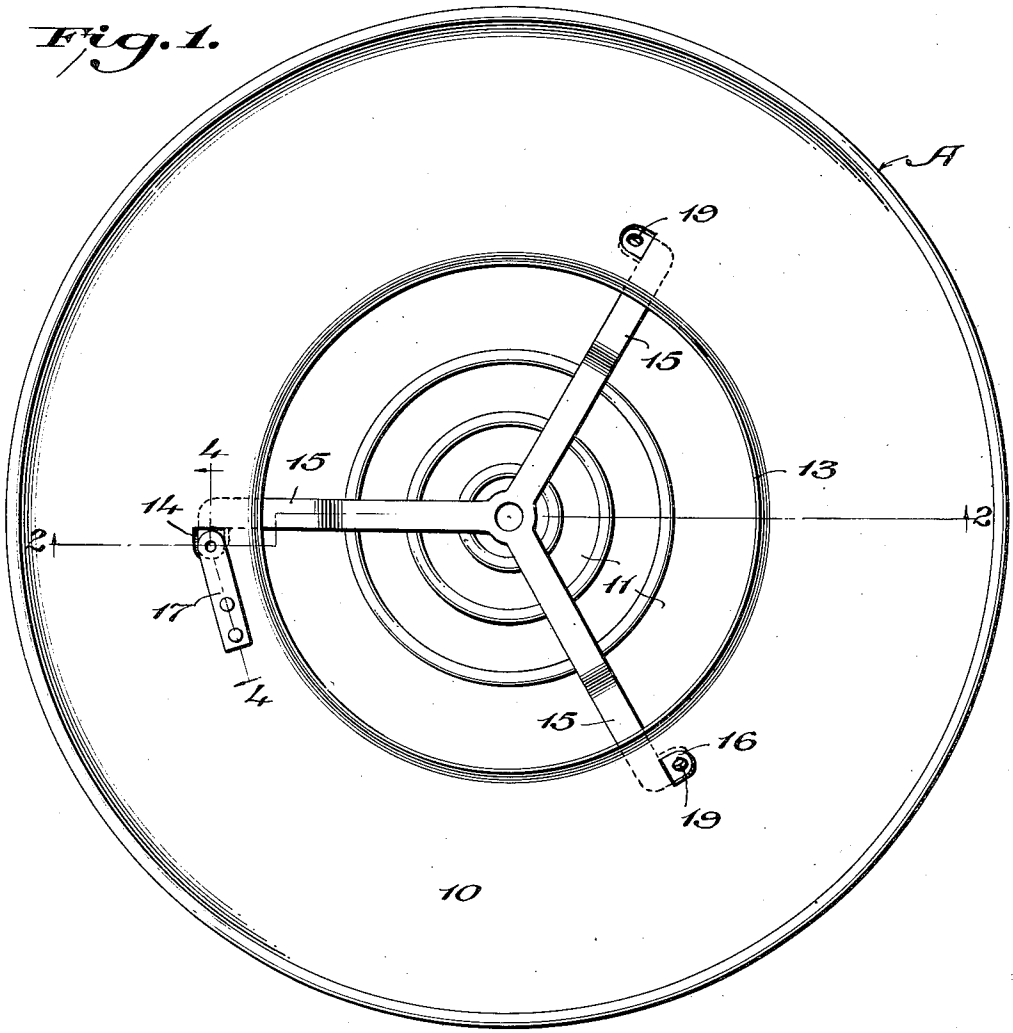
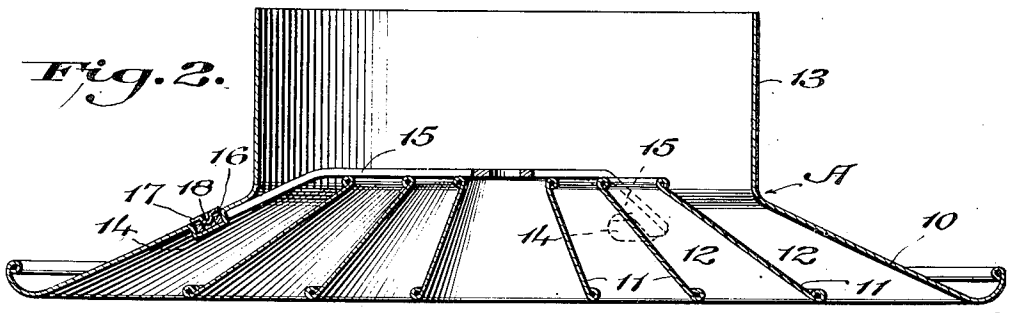


Fig. 2.



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Fig. 3.

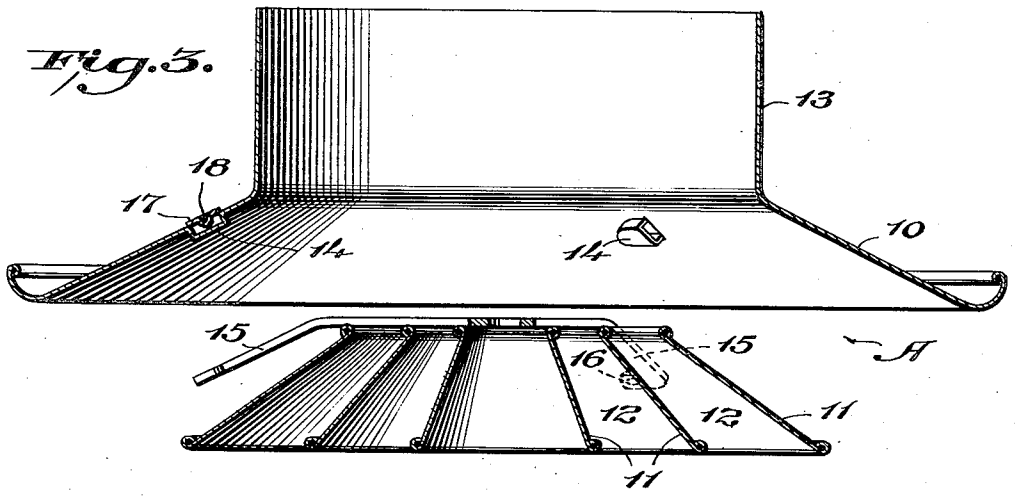


Fig. 4.

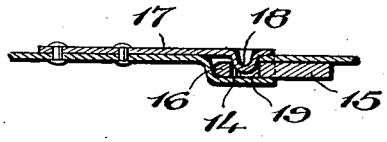


Fig. 5.

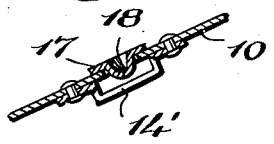


Fig. 6.

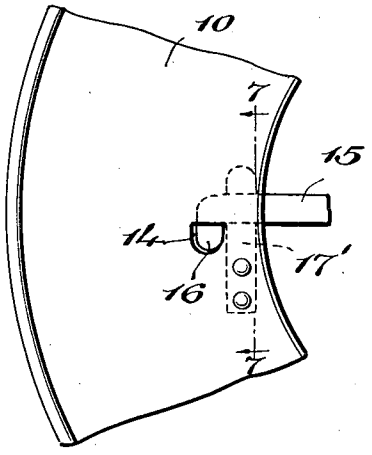
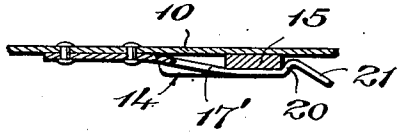


Fig. 7.



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AIR OUTLET DEVICE FOR VENTILATING APPARATUS

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8 Claims. (Cl. 98—40)

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This invention relates generally to ventilating apparatus and particularly to air outlet devices for effecting delivery of air from air supply ducts, fans or the like in diffused or other desired form into rooms or other enclosures for heating, cooling, ventilating or other purposes.

An air outlet device of the type with which the present invention is concerned comprises a first member having therein an opening through which air supplied to the device flows, and at least one other member disposed to intercept air flowing through said opening and to deflect it more or less laterally outward. Usually the first member is of open-ended, hollow, flaring form, although it may be of flat or substantially flat, disk-like or other form. Usually, too, there are a plurality of the air intercepting and deflecting members which likewise usually are of open-ended, hollow, flaring form, but which may be of flat or substantially flat, disk-like or other form. In any event, it is desirable to provide readily detachable connections between the second member, or members, and the first member to facilitate operative mounting of the second member, or members, relative to the first member and also to enable the second member, or members, readily to be removed from the first member for any desired reason and to be equally as readily replaced. This is a broadly old concept as evidenced by prior patent, No. 2,229,747, of January 28, 1941 which discloses detachable connections between an outermost, open-ended, hollow, flaring member and a series of similar but successively smaller members which are joined together as a unit and which are effective to divide air flowing through the device into a plurality of separate streams and to deflect the streams more or less laterally outward, whereby the air is delivered from the device in diffused form. However, according to said prior patent, the said detachable connections are of a screw type which require the use of a tool, such as screwdriver, to effect tightening and loosening of the same. Consequently, since a workman must employ one of his hands to manipulate a tool to effect tightening or loosening of said connections, only his single, remaining hand is free for use to support and position the member, or members, to be installed in or removed from the outermost member while the connections are being made or released. There is the danger, therefore, that the member, or members, to be mounted in or removed from the outermost member may be dropped and damaged during their installation or removal. In any event, to employ only one hand

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to hold the member, or members, to be installed in or removed from the outermost member while manipulating a tool with the other hand, makes the installation or removal of the first mentioned member, or members, a more or less tedious, difficult and time-consuming operation, especially in instances where the member, or members, to be installed or removed is or are, of large size and correspondingly heavy and cumbersome.

As an improvement upon the structure disclosed in aforesaid Patent No. 2,229,747, there is disclosed in a subsequent application, Serial No. 18,116, filed March 31, 1948, in which we are joint applicants, means whereby, in a device of the type under discussion, a second member, or members, may be connected with and disconnected from a first member by rotation of the second member, or members, relative to the first member. However, according to said application, a positively acting latch is employed to hold the second member, or members, against rotation relative to the first member in a direction to release the second member, or members, from the first member. Being positive in its action, said latch must be held released during connection and disconnection of the second member, or members, to and from the first member. Thus, while the structure of said application is an improvement upon the structure of said prior patent in that it avoids screw-type connections between the members, it nevertheless requires the use of one hand of a workman to manipulate the latch and leaves only his single, remaining hand free to support and position the second member, or members, during its, or their, installation in or removal from the first member.

Accordingly, the object of the present invention is to provide, in an air outlet device of the type under discussion, means of the character disclosed in said application, Serial No. 18,116, whereby a second member, or members, may be connected with or disconnected from a first member simply by rotation of the second member, or members, relative to the first member, and, in addition, to provide friction latch means to resist, but not to positively prevent, rotation of the second member, or members, relative to the first member in a direction to disconnect the second member, or members, from the first member. Any necessity of using a tool of any kind to connect or disconnect the second member, or members, with or from the first member thereby is avoided. Therefore, a workman may use both of his hands to handle the second member, or mem-

bers, during its or their installation or removal with all consequent advantages. Moreover, installation or removal of the second member, or members, may be effected far more expeditiously and rapidly than by means of connections employed in accordance with prior practice.

With the foregoing and other objects in view, as will become more fully apparent as the nature of the invention is better understood, the same consists in an air outlet device embodying the novel features of construction, combination and arrangement of parts as are illustrated by way of example in the accompanying drawings and as will be hereinafter more fully described and claimed.

In the accompanying drawings, wherein like characters of reference denote corresponding parts in the different views:

Fig. 1 is a rear elevation of an air outlet device embodying the features of the invention.

Fig. 2 is a cross section on the line 2—2 of Fig. 1.

Fig. 3 is a view similar to Fig. 2 showing the inner, unitary assembly of flaring members of the device separated from the larger or outermost member of the device.

Fig. 4 is a detail section on the line 4—4 of Fig. 1.

Fig. 5 is a detail cross sectional view illustrating an alternative form of keeper element which may be employed as part of the invention.

Fig. 6 is a fragmentary view similar to Fig. 1 illustrating an alternative form of friction latch which may be employed as part of the invention; and

Fig. 7 is a section on the line 7—7 of Fig. 6.

Referring to the drawings in detail, A designates generally an air outlet device of a well-known type which is composed of an outermost, open-ended, hollow, flaring member 10 and a plurality of other successively smaller, open-ended, hollow, flaring, air deflecting members 11 spaced inwardly from the member 10 and from one another to provide between said members a plurality of flaring passageways 12.

Air for heating, cooling, ventilating or any other desired purpose is supplied from any suitable source of supply through the rear, open ends of the members 10 and 11 and is divided by said members into a plurality of separate streams which are deflected more or less laterally outward by the members 11. As a result, the air is delivered from the device in diffused form.

Appropriately, the member 10 may have a neck 13 extending rearwardly therefrom to facilitate connection of the device with an air supply duct or other source of air supply. However, said neck is not essential and need not be provided in instances where, for example, air is supplied to the device by a fan or the like. Moreover, in accordance with the invention, the members 10 and 11 are not necessarily of flaring form, but may be of more or less flat, disk-like or other desired form. Furthermore, the device may include a plurality of air deflecting members 11, or only a single such member. In any event, the member 10 is provided with suitable keeper elements 14 and the member, or members, 11, as the case may be, has or have radiating or otherwise suitably extending therefrom arms 15 the outer or free end portions 16 of which are disposed at right angles or substantially right angles to said arms so that they may be caused to enter or leave the keeper elements 14 by rotation of the member, or members 11 relative to the member 10. In this connection it will of course be understood that the keeper

elements 14 and the arms 15 correspond in number and disposition relative to each other so that the end portions 16 of the arms 15 enter and leave the keeper elements 14 simultaneously.

The keeper elements 14 may be provided by forwardly depressing portions of the member 10, as illustrated in Figs. 1 to 4 of the drawings, or by means of members 14' of U-shaped cross section, as illustrated in Fig. 5 of the drawings, which members may be welded, riveted or otherwise suitably secured against the front face of the member 10. In any event, each of said keeper elements is open at least at one end thereof to permit the end portions 16 of the arms 15 to enter and leave said elements by rotation of the member, or members, 11 relative to the member 10.

Assuming a separated relationship of the member, or members, 11 from the member 10, as illustrated in Fig. 3 of the drawings, the said member, or members, 11 are connectible with the member 10 by first alining the end portions 16 of the arms 15 with the open ends of the keeper elements 14 and by then rotating said member, or members, 11 relative to the member 10 in a direction to cause the said end portions 16 of said arms 15 to enter said keeper elements. Thereby, the member, or members, 11, becomes or become positively interlocked with the member 10 against longitudinal movement relative thereto as is apparent. Rotation of the member, or members, 11 in the opposite direction relative to the member 10 is, of course, effective to disconnect the member, or members, 11 from the member 10.

In any instance where an outlet device embodying the features of the invention includes more than one air deflecting member 11, as usually is the case, the arms 15 may appropriately be employed to fasten said members together as a unit either by means of being welded, riveted or otherwise suitably fastened to said members.

In accordance with the present invention, friction latch means is employed to releasably hold the end portions 16 of the arms 15 in the keeper elements 14. As illustrated in Figs. 1 to 4 of the drawings, said latch means comprises a leaf spring 17 located at the rear side of the member 10 and having one end portion thereof riveted, welded or otherwise suitably fastened to said member 10 and its other end portion free for forward and rearward flexure and overlying one of the keeper elements 14. In addition, said latch means comprises a protuberance 18 projecting forwardly from the free end portion of the leaf spring 17 to enter an opening or recess 19 in an arm end portion 16 disposed in the said keeper element which the free end portion of said spring overlies. In this connection, the keeper elements 14 and the arms 15 preferably are spaced equidistantly apart and each of the arm end portions 16 preferably is provided with an opening or recess 19 so that when connecting the member, or members, 11 with the member 10 it is unnecessary to associate any particular arm end portion 16 with any particular keeper element 14. In any event, when the member, or members, 11 is, or are, rotated to enter the arm end portions 16 in the keeper elements 14, the free end portion of the leaf spring 17 first is flexed rearwardly by engagement of the arm end portion 16 with the protuberance 18 and then springs forwardly to engage said protuberance in the opening or recess 19 when the arm end portions 16 fully enter the keeper

elements 14 and said opening or recess 19 becomes alined with said protuberance. Thus, the spring 17 is effective to retain the arm end portions 16 in the keeper elements 14 against any possibility of their accidental withdrawal therefrom. However, by exerting a sufficiently forceful rotative effort upon the member, or members, 11 in a direction to withdraw the arm end portions 16 from the keeper elements 14, the protuberance 18 will be urged rearward out of the opening or recess 19 and thereby the member, or members, 11 may be disconnected from the member 10. It will thus be apparent that both hands of a workman may advantageously be employed to handle the member, or members, 11 during its or their connection with or disconnection from the member 10 and that the connection or disconnection may be effected expeditiously simply and primarily by rotation of the member, or members, 11 relative to the member 10. It will further be apparent that when the member, or members, 11, is, or are, operatively connected to the member 10, it, or they, is, or are, held frictionally and securely, yet releasably in assembly with said member 10.

Figs. 6 and 7 of the drawings illustrate a latch means of alternative form which operates in the same general manner as the latch means just described, but which differs from said described latch means in that it cooperates with an arm 15 as distinguished from the end portion 16 of said arm. According to Figs. 6 and 7 of the drawings, the latch means comprises a leaf spring 17' having one end portion thereof fastened against the front face of the member 10 and its other end portion free for forward and rearward flexure and disposed to extend across the front of one of the arms 15 when the end portion 16 of said arm is disposed in one of the keeper elements 14 or 14'. In addition, the said free end portion of the spring 17' is bent first rearwardly, as indicated at 20, and then at a forward inclination, as indicated at 21, to provide, on the one hand, a shoulder for engagement with the rear edge of the arm 15 to hold said arm against movement in a direction to withdraw its end portion 16 from the keeper element 14 or 14' and, on the other hand, to provide a terminal, forwardly inclined tongue for engagement by the arm 15 during movement thereof to enter its end portion 16 in the keeper element 14, whereby the free end portion of said spring 17' is urged forwardly to permit the arm 15 to pass between the same and the member 10.

Obviously, only a single latch spring 17 or 17' is required to hold the member, or members, 11 against rotation relative to the member 10. If desired, however, there may be a latch spring individual to each of the keeper elements 14 or 14'.

From the foregoing description considered in connection with the accompanying drawings, it is believed that the construction and operation of the present outlet device will be clearly understood and its advantages appreciated. It is desired to point out, however, that while only certain specific embodiments of the invention have been illustrated and described, the same is readily capable of specifically different embodiments within its spirit and scope as defined in the appended claims.

I claim:

1. An air outlet device comprising a member having therein an opening through which air supplied to the device flows, at least one other member disposed to intercept air flowing through said opening and to deflect it laterally outward, means operable responsive to rotation of said second mentioned member in one direction relative to said first mentioned member to connect said second mentioned member to said first mentioned member positively against movement longitudinally relative thereto in either direction and responsive to rotation of said second mentioned member in the opposite direction relative to said first mentioned member to disconnect said second mentioned member from said first mentioned member, and friction latch means separate from said first mentioned means to resist rotation of said second mentioned member relative to said first mentioned member in a direction to disconnect said second mentioned member from said first mentioned member.

2. An air outlet device comprising a member having therein an opening through which air supplied to the device flows, at least one other member disposed to intercept air flowing through said opening and to deflect it laterally outward, keeper elements carried by one of said members, arms carried by the other of said members and having end portions which, responsive to rotation of said second mentioned member in one direction relative to said first mentioned member, are engageable with said keeper elements to connect said second mentioned member to said first mentioned member positively against longitudinal movement relative thereto and which, responsive to rotation of said second mentioned member in the opposite direction relative to said first mentioned member, are disengageable from said keeper elements to disconnect said second mentioned member from said first mentioned member, and friction latch means separate from said keeper elements and said arms to resist rotation of said second mentioned member relative to said first mentioned member in a direction to disengage the said end portions of said arms from said keeper elements.

3. An air outlet device comprising a member having therein an opening through which air supplied to the device flows, at least one other member disposed to intercept air flowing through said opening and to deflect it laterally outward, keeper elements carried by one of said members, arms carried by the other of said members and having end portions which, responsive to rotation of said second mentioned member in one direction relative to said first mentioned member, are engageable with said keeper elements to connect said second mentioned member to said first mentioned member positively against longitudinal movement relative thereto and which, responsive to rotation of said second mentioned member in the opposite direction relative to said first mentioned member, are disengageable from said keeper elements to disconnect said second mentioned member from said first mentioned member, and friction latch means separate from said keeper elements and said arms carried by said first mentioned member for engagement with at least one of said arms to resist rotation of said second mentioned member relative to said first mentioned member in a direction to disengage the said end portions of said arms from said keeper elements.

4. An air outlet device as set forth in claim 2 in which the arm end portions have recesses therein, and in which the friction latch means comprises a leaf spring fastened to one of the members and having a protuberance extending

therefrom for engagement in the recess of one of the arm end portions when the arm end portions are operatively engaged in the keeper elements.

5. An air outlet device as set forth in claim 2 in which the friction latch means comprises a leaf fastened to one of the members and having a shoulder for engagement with one of the arms to hold the end portions of the arms operatively engaged in the keeper elements.

6. An air outlet device comprising an outermost open-ended hollow flaring member to be supplied with air through its smaller or rear end, at least one other smaller hollow flaring member disposed within and spaced from said outermost member to intercept air flowing through the latter member and to deflect it laterally outward, keeper elements carried by said outermost member at the front side thereof, arms carried by the other of said members and having end portions which, responsive to rotation of said other member in one direction relative to said outermost member, are engageable with said keeper elements to connect said other member to said outermost member against longitudinal movement relative thereto and which, responsive to reverse rotation of said other member relative to said outermost member, are disengageable from said keeper elements to disconnect said other member from said outermost member, and friction latch means separate from said keeper elements and said arms to resist rotation of said other member relative to said

outermost member in a direction to disengage the said end portions of said arms from said keeper elements.

7. An air outlet device as set forth in claim 6 in which at least one of the arm end portions has a recess therein, and in which the friction latch means comprises a leaf spring fastened to the outermost flaring member and having a protuberance extending therefrom for engagement in said recess when the arm end portions are operatively engaged in the keeper elements.

8. An air outlet device as set forth in claim 6 in which the friction latch means comprises a leaf spring fastened to the outermost flaring member and having a shoulder for engagement with one of the arms to hold the end portions of the arms operatively engaged in the keeper elements.

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WILLIAM J. WAELDNER.

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