

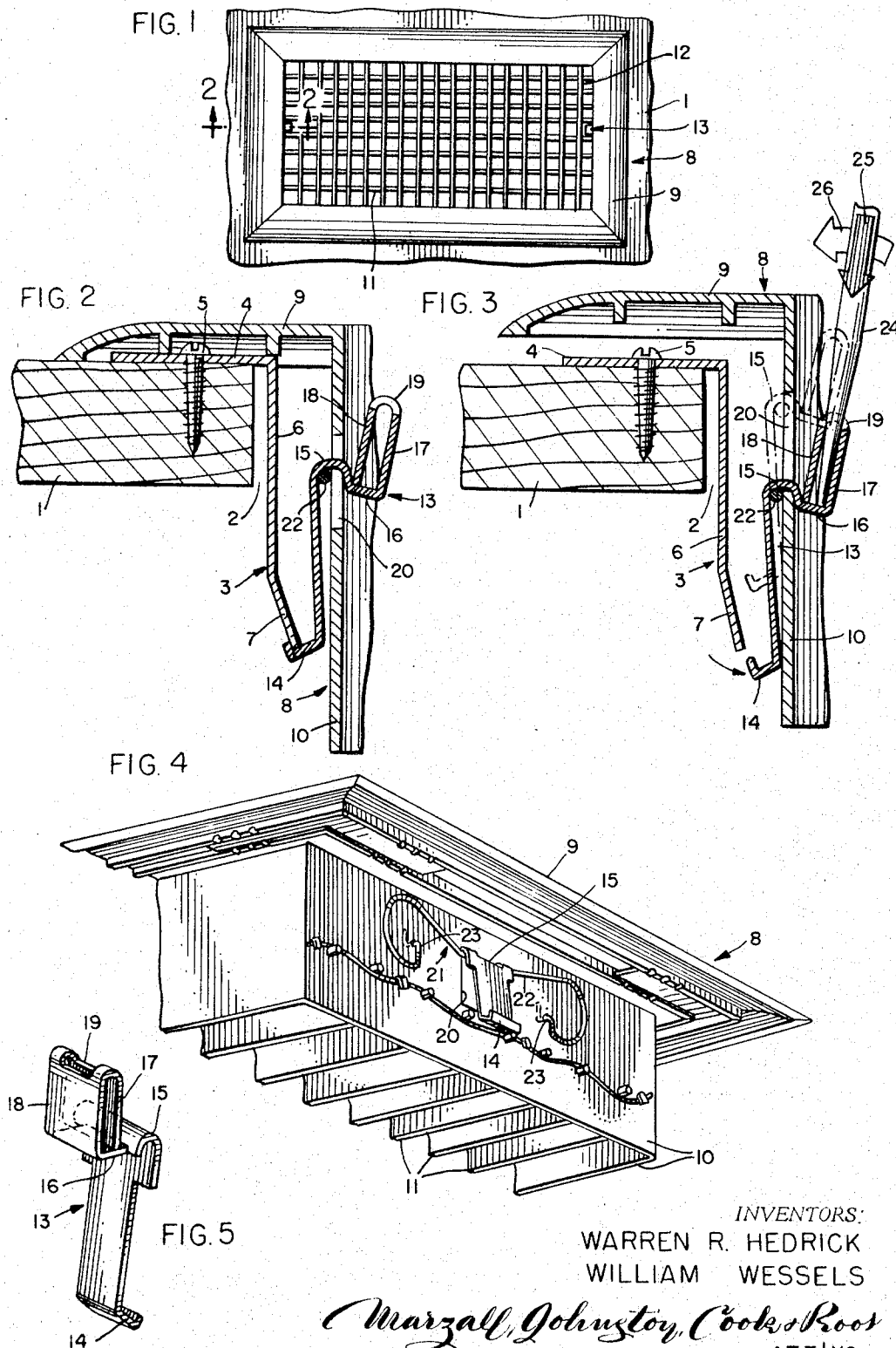
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AIR DIFFUSER ASSEMBLY INCLUDING LATCHING MEANS

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AIR DIFFUSER ASSEMBLY INCLUDING LATCHING MEANS

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This invention relates in general to air diffusers adapted to be located in the wall or ceiling of a room, and more particularly to an air diffuser assembly wherein the grille or register through which the air passes may be mounted in an opening in the wall or ceiling without the use of screws or other external fastening means.

It is well known that when registers are mounted in a wall or ceiling opening, it is customary to secure them in place by the use of screws extending through the marginal portions of the register which overlie the periphery of the opening. Not only does this present an unpleasant appearance due to the interruption of the smooth surface of such marginal portions, but also creates problems when the register is to be removed and then replaced.

For example, it is customary to extend the plaster, which forms the wall or ceiling of the room, to the edge of the opening therein so that screws extending through the marginal portion of the register will have to extend into such plaster. Repeated removal and remounting of the register may cause the plaster to loosen or crumble and make it more difficult to securely mount the register over the opening.

The present invention is directed to an air diffuser assembly in which a releasable latching member concealed beneath the register is used to mount the register on a frame member located in the wall opening.

It is, therefore, one of the principal objects of the present invention to provide an air diffuser assembly wherein a register unit may be detachably mounted in an opening in the wall or ceiling of a room by the use of a latching member which is at least partially concealed, thereby enabling the marginal portions of the register to present a continuous surface uninterrupted by the use of screws or other external fastening means.

Another object of the invention is to provide an air diffuser assembly with a latching device operable by manipulating a tool from outside of the register or diffuser to attach and detach the register with respect to the wall opening.

A further object of the invention is the provision of a novel form of latching device on the register of an air diffuser assembly, wherein said device includes a latching member movable with respect to the register, against spring tension, into latching engagement with a frame member in a wall opening for mounting the register therein, and out of latching engagement therewith for removal of the register therefrom.

A still further and more specific object of the invention is the provision of a novel form of latching device in an air diffuser assembly, wherein a latching member is mounted on a register and is movable, against spring tension, with respect thereto into a position wherein interengaging parts on the latching member and on a frame within a wall opening are engaged to retain the register securely in place. Manipulation of the latching member by the use of a tool may move the member to disengage it from the surrounding frame and permit removal of the register.

Other objects and advantages of the invention will become apparent upon reading the following description taken in conjunction with the accompanying drawing, in which

FIG. 1 is an elevational view of an air diffuser assembly embodying the present invention;

FIG. 2 is an enlarged, fragmentary, sectional view at one side of the assembly taken substantially along the plane of line 2—2 of FIG. 1, and showing the latching device in latched position;

FIG. 3 is a view similar to FIG. 2 but showing the latching device in unlatched position;

FIG. 4 is a fragmentary perspective view of a register illustrating the manner of mounting the latching member thereon, and

FIG. 5 is a perspective view of the latching member.

Air diffusers are usually mounted in an opening in the wall or ceiling of a room at the outlet end of an air duct. Such an air diffuser assembly includes a register or grille which may be provided with directional vanes or louvers to control the direction of air flow. In FIGS. 1, 2 and 3 the numeral 1 indicates the wall or ceiling of a room which is provided with an opening 2 therein. An outer frame member generally indicated by the numeral 3 is secured within the opening and conforms to the peripheral shape thereof. That is to say, the opening may be square, rectangular, circular, or any other desired shape. The outer frame member 3 is provided with a marginal flange portion 4 adapted to overlie the periphery of the opening 2 and to be secured to the wall 1 by means such as screws 5.

This outer frame 3 also has a rearwardly extending flange portion 6 which likewise conforms to the periphery of the wall opening. For purposes of illustration, the opening herein is shown as rectangular so that the outer frame member is also rectangular with the rearwardly extending flanges 6 preferably positioned at all four sides of the opening.

The rear edge of each flange portion 6 terminates in a rearwardly and inwardly extending portion 7 for a purpose which will be brought out more clearly hereinafter.

The register unit is generally indicated by the numeral 8, and comprises a marginal flange portion 9, adapted to overlie the edge of the opening and the outer frame member 3, and a rearwardly extending flange portion 10. Since the opening in the wall as shown is rectangular, there will be four such rearwardly extending flanges 10, one for each side of the opening.

As mentioned above, the register unit preferably will have a plurality of directional vanes or louvers therein. The number and arrangement of such louvers form no part of the present invention but for purposes of illustration there have been shown a plurality of horizontally extending louvers 11 behind which there are a plurality of vertically extending louvers 12.

The latching device of the present invention is located preferably on opposed sides of the register unit. Obviously, they could be positioned on all four sides, or the upper and lower sides, but in the illustrated embodiment there is a latching device at each end of the register. This latching device includes a latching member illustrated in FIG. 5 and is identified generally by the numeral 13. This member, as shown, includes an elongated substantially flat body portion which has at its rearmost end a return bend forming a hook 14. The body then continues forwardly toward the opening of the register unit and is bent over intermediate the ends thereof to form a spring-receiving recess 15, as will become evident hereinafter. The body of the latching member then extends inwardly for a short distance, as at 16, and then forwardly again, as at 17. It is then provided with a return-bent portion 18 which extends outwardly and rearwardly in the same general direction as the portion 17, but is spaced therefrom as shown.

This forward end of the latching member which is composed of the spaced sides 17 and 18 is provided with a

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tool-receiving portion for the reception of a tool, whereby the latching device may be manipulated. This tool-receiving portion may assume any desired construction, but for ease in manufacture the forward end of the latching member is provided with an opening or a slot 19 in that portion thereof which connects the two spaced sides 17 and 18. Thus, any suitable elongated and relatively flat tool can be inserted into the slot 19 and be used to move the latching member into and out of engagement with the outer frame member as described hereinafter.

An opening 20 is provided in the rearwardly extending flange portion 10, into which the latching member 13 is placed. This latching member is inserted therein in such a way that the hook 14 at the rearmost end thereof is on the outer side of the flange 10 and is positioned adjacent the rearwardly and inwardly extending edge portion 7 of the flange 6 on the outer frame member. The return-bent portion 15 extends partially through the opening 20 so that the forward end of the latching device, consisting of the spaced connecting portions 17 and 18 will be located on the inner side of the flange 10 with the opening 19 thereof facing forwardly of the register unit.

The latching member 13 is mounted on the flange 10 by yieldable mounting means, such as the spring wire generally indicated at 21. This spring wire may assume any desired and convenient configuration as long as a portion thereof can be received by the latching member to bias that member in a direction forwardly of the register. In the form illustrated, the spring 21 has an intermediate portion 22 which passes through the return-bent portion 15 of the latching member and is received thereby. The spring wire 21 then continues outwardly in opposite directions from the latching member and is curved so that the ends 23 thereof are mounted on the flange 10. The securing of this spring member may be of any suitable means but in the illustrated embodiment the ends 23 are shown as extending through openings in the flange 10 and locked therein.

The spring member 21 is biased so that it tends to move the latching member in a forward direction toward the opening in the wall. In the normal and free position of the parts they will appear as shown in the dot-dash lines in FIG. 3. The return-bent portion 15 of the latching member will be urged by the spring against the forward edge of the opening 20 in the flange 10. This is the condition of the parts prior to assembly.

When the register unit is to be mounted in the wall opening, the outer frame member 3 is already in place. The register unit is inserted therein so that the marginal flange 9 overlies the wall surrounding the opening therein. An elongated thin tool, such as a screwdriver 24, may be inserted by hand into the slot 19 at the forward end of the latching member. Rearward pressure on the tool in the direction of the arrow 25 will move the latching member 13 rearwardly against the tension of spring 21 to the full line position of FIG. 3. Movement of the tool in a clockwise direction will impart a slight rotative movement to the latching member so that when pressure is released, the hook end 14 will be moved forwardly by the spring 21 into engagement with the rearmost edge of the flange 7. At this point the register unit and outer frame member will be securely locked together in position as shown in FIG. 2.

When it is desired to remove the register, a suitable tool is again inserted in the slot 19 and pressure is exerted on the latching member against the tension of spring 21 to move the latching member out of engagement with the flange on the outer frame member. A counterclockwise rotation of the tool 24 in the direction of the arrow 26 will then move the latching member to the full line position of FIG. 3 where the hook 14 will be free of the flange portion 7, so that a release of the pressure will cause the spring 21 to move the latching member forwardly, whereupon the register unit may be removed.

From the foregoing description it will be evident that

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we have produced an air diffuser assembly having a novel latching device associated therewith which eliminates the undesirable characteristics of screws or similar fastening means positioned externally of the register. The present device also eliminates many of the disadvantages and undesirable characteristics of other constructions which have attempted to provide concealed fastening means. The provision of the yieldable mounting means for the latching device provides tension at all times while the register unit and outer frame member are in assembled relation. Disassembly is quickly and easily achieved by the mere insertion of a tool into the tool-receiving portion at the forward end of the latching member and exerting first a rearward pressure and then a rotative movement which disengages the interengaging parts of the latching member and outer frame.

Changes may be made in the form, construction and arrangements of parts from those disclosed herein without in any way departing from the spirit of the invention or sacrificing any of the attendant advantages thereof, provided, however, that such changes fall within the scope of the claims appended thereto.

The invention is hereby claimed as follows:

1. An air diffuser assembly comprising, an outer frame member mounted in an opening in the wall of a room, and an inner register unit detachably mounted on said outer frame member, said inner register unit having a marginal frame overlying the periphery of said opening, rearwardly extending flange portions and a latching device thereon to detachably mount said unit on said outer frame member, said latching device including a latching member having a rear end thereof extending rearwardly and outwardly of a said flange portion and terminating adjacent said outer frame member, and a forward end extending forwardly and inwardly of said flange portion, yieldable means mounting said latching member on said register unit and biasing it in a forward direction, thereby rendering said latching member movable with respect to said register unit, and interengaging means on said outer frame member and on said latching member to lock said outer frame member and said inner register unit together when said interengaging means are engaged, said latching member being movable rearwardly against the bias of said yieldable means and then inwardly thereof to disengage said interengaging means and permit removal of said register unit.

2. An air diffuser assembly as defined in claim 1 wherein said latching member passes through an opening in said flange portion, thereby positioning the rear end thereof on the outer side of said flange portion and the forward end thereof on the inner side of said flange portion.

3. An air diffuser assembly as defined in claim 1 wherein said yieldable means is an elongated wire spring mounted on said flange portion.

4. An air diffuser assembly as defined in claim 2 wherein said yieldable means is an elongated wire spring mounted on said flange portion.

5. An air diffuser assembly as defined in claim 3 wherein said latching member is provided, intermediate the ends thereof, with means for receiving a portion of the length of said spring, whereby said latching member may have a limited rotative movement about said portion of the spring as an axis.

6. An air diffuser assembly as defined in claim 1 wherein said interengaging means includes a hook portion on the rear end of said latching member and an inwardly and rearwardly extending edge portion on said outer frame member.

7. An air diffuser assembly as defined in claim 1 wherein the forward end of said latching member is provided with a tool-receiving portion adapted to receive a tool for manipulating said latching member and operating said interengaging means.

8. An air diffuser assembly as defined in claim 6 where-

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in the forward end of said latching member is provided with a tool-receiving portion adapted to receive a tool for moving said hook portion into and out of engagement with said edge portion on said outer frame member.

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