

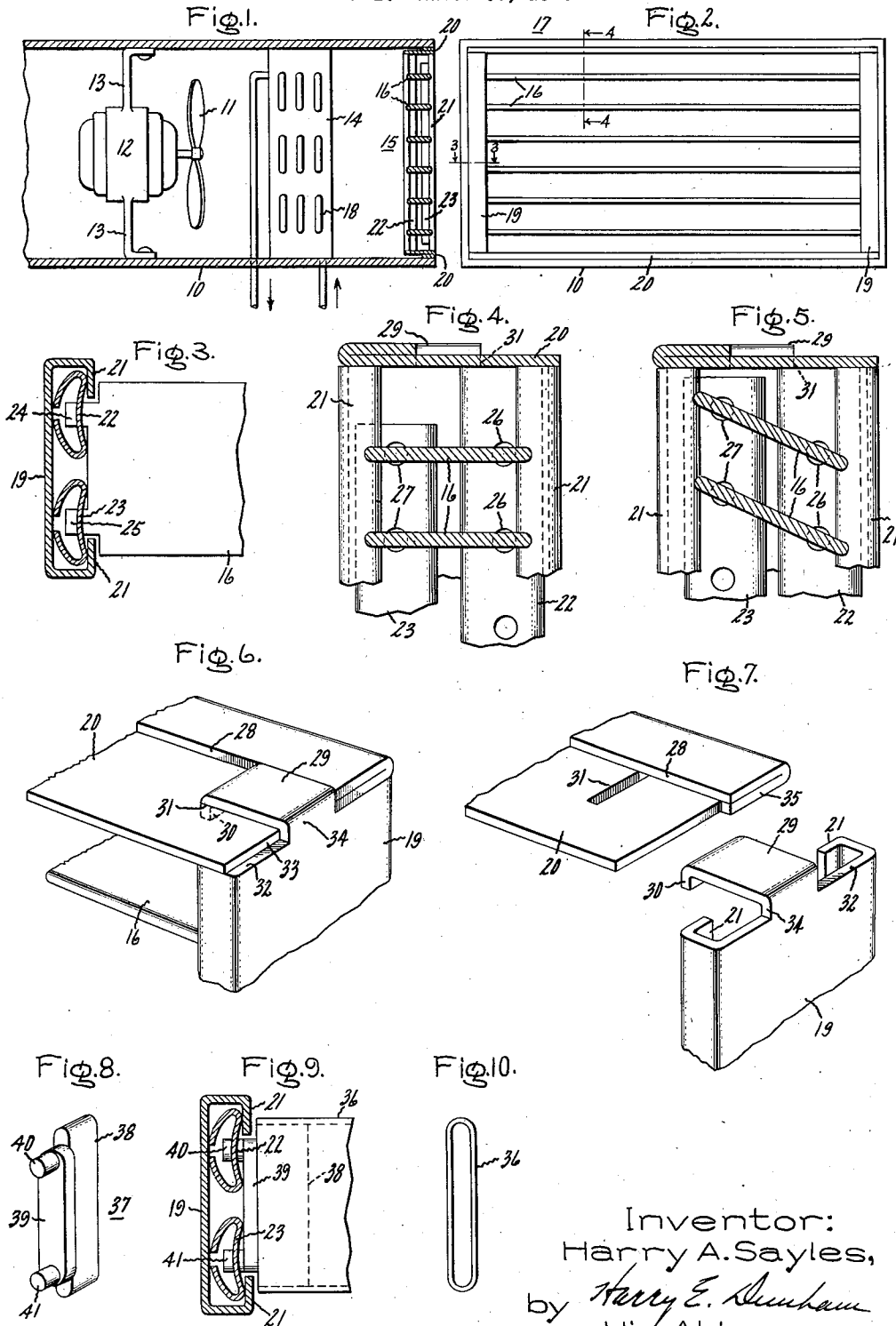
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GRILLE FOR AIR CIRCULATORS

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GRILLE FOR AIR CIRCULATORS

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6 Claims. (Cl. 98—110)

My invention relates to air circulators and similar devices, and particularly to grilles for controlling the flow of air discharged from said devices.

Air circulators and the outlets of air conditioning systems are commonly provided with grilles comprising a plurality of vanes or louvers arranged to vary the opening of the outlet or to select the direction of flow of the air discharged from the outlet. In some such devices, it is desirable to vary the direction of air discharge selectively from time to time to change the direction of the circulation of air throughout an enclosure and some arrangement is therefore provided for holding the louvers in any one of a plurality of selected positions.

It is an object of my invention to provide a grille for air circulators and the like having an improved arrangement for holding the louvers or vanes in position in the grille and for retaining them in any desired position within their range of movement.

Another object of my invention is to provide a grille for air circulators and similar devices of an improved and simplified construction which may readily be assembled or taken apart for adjustment or repair.

Further objects and advantages of my invention will become apparent as the following description proceeds, and the features of novelty which characterize my invention will be pointed out with particularity in the claims annexed to and forming a part of this specification.

For a better understanding of my invention reference may be had to the accompanying drawing in which Fig. 1 is a sectional side elevation view of an air conditioning system provided with an outlet grille embodying my invention; Fig. 2 is a front elevation view of the outlet grille shown in Fig. 1; Fig. 3 is an enlarged sectional view on line 3—3 of Fig. 2; Fig. 4 is an enlarged sectional view on the line 4—4 of Fig. 2; Fig. 5 is a view similar to Fig. 4 with the louvers shown in position to direct the discharged air upwardly; Fig. 6 is an enlarged detail perspective view of a corner of the grille shown in Fig. 2; Fig. 7 is a perspective view of the corner members shown in Fig. 6 in position for assembly; and Figs. 8, 9 and 10 are enlarged fragmentary views of the grille shown in Fig. 2 provided with a modified form of louver.

The illustrated embodiment of my invention comprises generally an outlet grille including a rectangular sheet metal frame comprising side and end members secured together by readily

detachable joints at the corners of the frame and a plurality of parallel louvers pivotally mounted within the frame in longitudinal members frictionally secured within the end members of the frame and pivotally connected with the louvers to retain the louvers in spaced relationship, one of the longitudinal members being movable with respect to the other in order to move the louvers in unison and pressing resiliently against the ends of the louvers to retain them in any desired position within their range of movement.

Referring now to the drawing, in Figs. 1 and 2 I have illustrated an air conditioning system including a duct 10 within which are arranged a fan 11 driven by a motor 12 mounted within the duct on arms 13 and a heat exchange unit 14 arranged in the path of the air circulated by the fan 11 and which may be either a heating coil or a cooling coil. The duct 10 is provided with a grille 15 at its outlet or discharge end. The grille 15 comprises a plurality of parallel louvers 16 pivotally mounted within a frame 17 for movement about axes longitudinal of the louvers. During the operation of the air conditioning system, air is circulated through the duct 10 by operation of a fan 11 and passes over the heat exchange unit 14 where it is heated or cooled by heat exchange with a fluid medium flowing through a conduit 18 in the unit, the heated or cooled air being discharged through the grille 15, the direction of discharge being determined by the angle at which the louvers 16 are set.

As shown in Figs. 1, 2, 3 and 4, the frame 17 comprises channel-shaped end members 19 connected at the corners of the frame to side members 20. The end members 19 have their edges turned to provide inner frame portions or flanges 21 spaced from the bottom wall or outer body portion of the channel member 19. Both end members 19 are of similar construction and are provided with elongated members 22 and 23 mounted therein and bearing against the ends of the louvers 16 and the flanges 21 and the bottom wall of the channel section. The members 22 and 23 are rigid longitudinally and resilient transversely and are slightly deformed by compression between the ends of the louvers and the channel 19 so that they exert pressure against the ends of the louvers to retain them frictionally in any desired position within their range of movement. Each of the louvers 16 is provided with tabs or trunnions 24 and 25, the trunnions 24 of the several louvers being pivotally mounted in openings 26 in the member 22 and the trunnions 25 being pivotally mounted in openings 27

in the member 23. Since the members 22 and 23 are rigid longitudinally, the louvers are retained in spaced parallel relation by their pivotal connections with these members.

As clearly shown in Fig. 3, the longitudinal members 22 and 23 are hollow and of a crescent-shaped cross-section concave on the side adjacent the ends of the louvers. These longitudinal members may be constructed of resilient strip material bent to provide the desired concave cross-section. The two sides of each strip which overlap the strip and are bent toward each other on the side of the members 22 and 23 adjacent the bottom of the channel may be spaced apart somewhat as illustrated to insure the desired resilience. The pivotal connections between the longitudinal members 22 and 23 and the louvers 16 are located in the concave portion of the longitudinal members and the pressure exerted on the ends of the louvers is transmitted through the edges of the concave portions of the longitudinal members which are located between the two series of trunnions 24 and 25. It will readily be apparent that longitudinal members are compressed between the flanges 24 engaging the outer edges of the concave portions of the members 22 and 23 and the body portion of the channel member 19 as well as between the ends of the louvers and the channel 19.

In order that the angular position of the louvers may be changed to direct the air stream to different selected portions of the enclosure to be conditioned, the longitudinal member 23 is made shorter than the member 22 so that it may be moved longitudinally in the channel member 19 by shifting the outer edges of the louvers up or down. The member 22 preferably is made the same length as the end members 19 of the frame so that it is retained securely in position longitudinally.

In Fig. 5 I have shown the louvers 15 arranged to direct the air upwardly, the longitudinal member 23 having been moved upwardly with respect to the member 22 and also having been moved laterally by the radial movement of the louvers. Since resilient pressure is maintained on the ends of the louvers at all times by the longitudinal members, the louvers may be held in any desired position within their range of pivotal movement on their trunnions 24.

The frame 17 is constructed so that it may be assembled without the necessity of employing bolts or screws and may readily be taken apart for adjustment or repair, the ends of the frame members being formed with complementary inter-fitting surfaces. Furthermore, the entire assembly of the louvers within the frame may be accomplished without the necessity of employing any additional securing or locking devices.

As shown in Figs. 6 and 7, the side members 20 are constructed of sheet metal having one edge bent back to provide a ridge or stop 23 longitudinally thereof, the bent portion also serving to reinforce the side members. The channel members 19 are provided with a tongue 29 arranged to lie along the ridge 23 and having a bent lug or inturned portion 30 adapted to fit within a transverse slot or groove 31 formed in the side wall 20 and extending out from the ridge 23. The tongue 29 is sufficiently resilient so that it may be bent away from its normal position sufficiently to allow the end of the member 20 to be placed on the end of the member 19 and the inturned portion 30 of the tongue

fitted within the groove 31. When the corners are assembled as shown in Fig. 6, the flat inner side of the member 20 is seated on a flat face or seat 32 formed by the end of the channel member, the seat 32 conforming to the channel-shaped cross-section. Furthermore, the tongue 29 and the ridge 23 are secured in contact and the end of the side member 20, as indicated at 33, closely abuts an upright portion 34 of the tongue 29. The inturned portion 30 of the tongue fits securely in the groove 31 and the entire corner is held rigidly against movement in any direction. The joint is further secured by an extension 35 of the double thickness portion of the side member 20 which engages the seat 32 on one side of the top of the channel member 19 and also engages the vertical portion 34 of the tongue 29.

Each of the corners of the frame is constructed in the same manner as the corner illustrated in Figs. 6 and 7. In order to assemble the grille the members 22 and 23 are secured in place in the channel members 19, the construction of the channel members at both ends of the frame being identical. The louvers are then placed in position with their trunnions 24 and 25 in the openings 26 and 27, respectively, and the side members 20 are secured in place by springing the tongues 29 formed at either end of the members 19 and pressing the members together until the portions 30 of the tongue snap into place in the grooves 31. Preferably the side members are first secured to one of the end members 19 and sufficient pressure is then applied to compress the longitudinal members 22 and 23 in both end members 19 when the other member 19 is secured in place at the other end of the grille.

In Figs. 8, 9 and 10, I have shown a further modification of my invention particularly adapted for use in larger grilles. The construction of the frame and longitudinal members 22 and 23 is identical with that described above and corresponding parts have been designated by the same numerals. The louvers are constructed of hollow sheet members 36 of elongated cross-section as shown in Fig. 10, and these members are provided with end pieces 37 as illustrated in Fig. 8, the end piece having a body portion 38 arranged to fit within the sheet metal louver 36 and having a head portion 39 provided with trunnions 43 and 41 adapted to fit the openings 26 and 27 in the longitudinal members 22 and 23 respectively.

From the foregoing, it is readily apparent that I have provided a simple, rugged and easily constructed outlet grille for air circulators and similar devices including a plurality of parallel louvers mounted for pivotal movement to determine the direction of discharge of the air and including an improved arrangement holding the louvers in any desired position.

While I have shown a particular form of my invention in connection with an air conditioning system, other modifications will readily be apparent to those skilled in the art. I do not, therefore, desire my invention to be limited to the particular construction described and illustrated, and I intend in the accompanying claims to cover all modifications within the spirit and scope of my invention.

What I claim as new and desire to secure by Letters Patent of the United States is:

1. A grille for air circulators and the like comprising a frame and a plurality of parallel louvers

pivotally mounted in said frame for movement about parallel longitudinal axes, and an elongated member slidably mounted in said frame adjacent one end of said louvers and pivotally secured to each of said louvers for connecting said louvers to move in unison, said member being rigid longitudinally having its side edges bent toward each other and forming overlapping spaced parallel portions so as to be resilient transversely whereby it may be compressed by pressure longitudinally of said louvers, said frame including portions engaging two opposite sides of said member and compressing said member whereby said member is slightly deformed and is retained frictionally in position in said frame and is adapted to hold said louvers in any desired position within their range of movement.

2. A grille for air circulators and the like comprising a frame and a set of parallel louvers, means for pivotally mounting said louvers in said frame for movement about longitudinal axes, the side of said frame adjacent one end of said set of louvers comprising an inner portion at one side of said louvers and an outer portion spaced therefrom and from the ends of said louvers longitudinally of said louvers, an elongated member slidably mounted in said frame at said end of said louvers for connecting said louvers for movement in unison and for holding said louvers in any desired position within their range of movement, said elongated member being rigid longitudinally and resilient transversely and having a concave transverse cross-section on its side adjacent said louvers, said elongated member being held under compression transversely thereof by said inner and outer frame portions and the ends of said louvers, said member engaging said louvers adjacent one edge of said concave side and said inner frame portion adjacent the other edge of said concave side.

3. A grille for air circulators and the like comprising a frame and a plurality of parallel louvers arranged in said frame to determine the direction of discharge of air passing through the outlet, a pair of elongated hollow members arranged in said frame at one end of said louvers and frictionally engaging said frame and the ends of said louvers and being compressed therebetween, said members being rigid longitudinally and resilient transversely, one of said members being shorter than the other of said members and being slidably longitudinally in said frame with respect to said other member, each of said louvers being pivoted at one side in said one of said members and at its other side in said other of said members whereby said louvers may be moved in unison by sliding of said one member in said frame and may be maintained in any desired position in their range of movement by their frictional engagement with said members.

4. A grille for air circulators and the like comprising a frame, a plurality of spaced parallel louvers arranged within said frame, one side of

said frame adjacent the ends of said louvers comprising a channel member having its edges bent to provide inturned flanges spaced from the bottom of the channel, means including a pair of elongated members resilient transversely and arranged within said channel member for retaining said louvers in spaced relation, each of said louvers being pivotally connected with both of said elongated members, one of said elongated members being slidable in said channel member longitudinally with respect to the other of said elongated members whereby the angular positions of said louvers may be changed in unison, each of said elongated members being arranged to engage the ends of said louvers and one of said flanges on one side and to engage said channel member on its other side and being compressed thereby whereby said louvers may be held frictionally in any desired position within their range of movement.

5. A rectangular frame for air grilles and the like including two frame members detachably connected at one corner of said frame, one of said members being of channel-shaped cross-section and having an end providing a flat seat for the end of the other of said members connected thereto, said other member having a flat surface on its side adjacent said one member and at the end thereof adapted to engage said flat seat and having a ridge on the other side thereof, said other member having a groove therein extending transversely with respect to said ridge, a bent tongue on said one member adapted to abut the end of said other member and having a portion adapted to extend across the outer surface of said other member in engagement with said ridge, said portion of said tongue having an inturned lug adapted to engage said groove on said other member when said tongue is in abutting relation with the end of said other member for retaining said members securely in engagement.

6. A frame for air grilles and the like including two frame members detachably connected to form a corner of said frame, one of said members having an end providing a flat seat for the end of the other of said members connected thereto, said other member having a flat surface on its side adjacent said one member and at the end thereof adapted to engage said flat seat and having a stop on the other side thereof, said other member having a groove therein extending transversely thereof and a bent tongue on said one member adapted to abut the end of said other member and having a portion adapted to extend across the outer surface of said other member in engagement with said stop, said portion of said tongue having an inturned lug adapted to engage said groove on said other member when said tongue is in abutting relation with the end of said other member for retaining said members securely in engagement.

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