

Feb. 27, 1940.

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AIR-FLOW REGULATOR FOR AIR-CONDITIONING SYSTEMS

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2 Sheets-Sheet 1

Fig. 1.

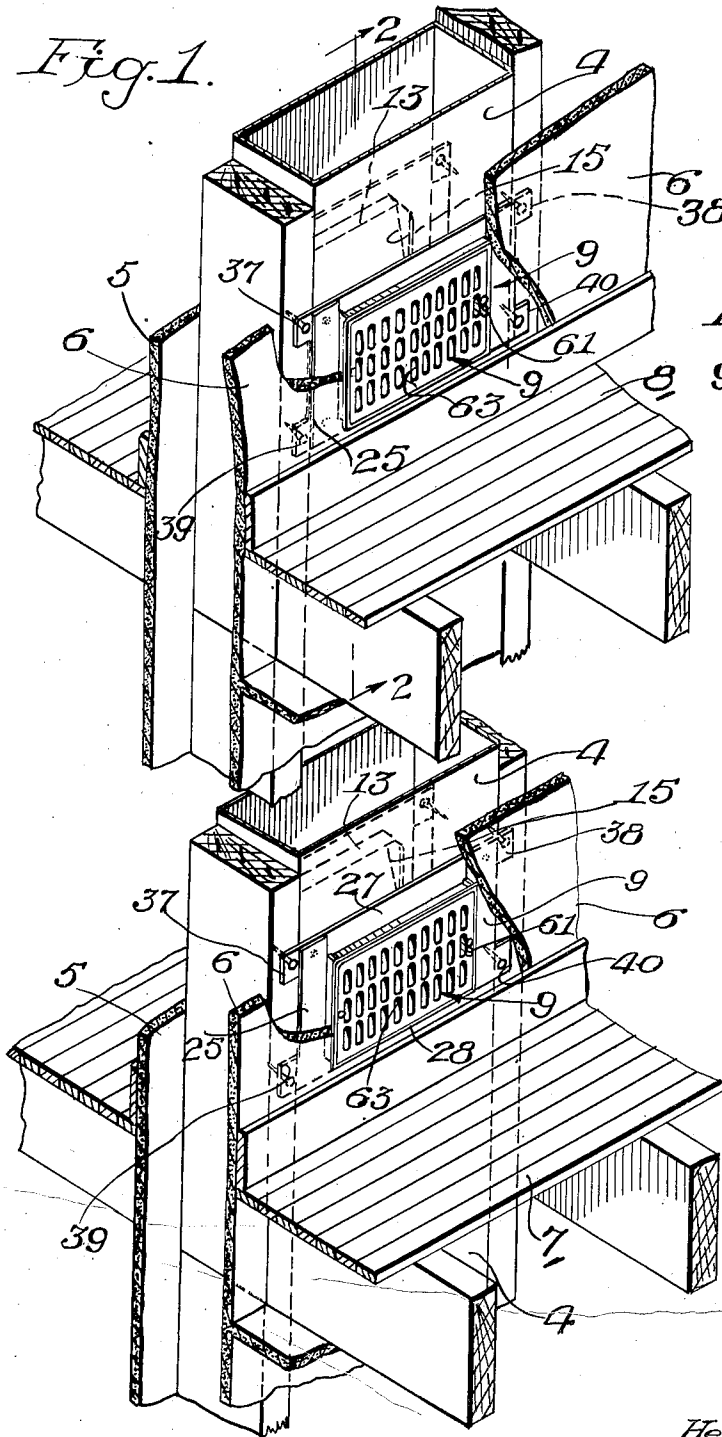
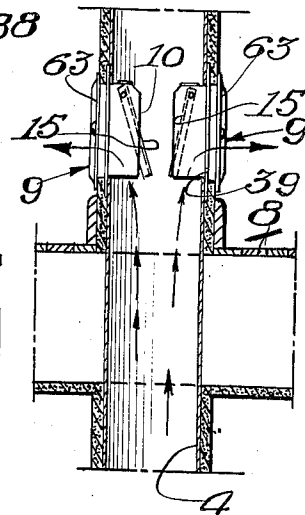


Fig. 2.



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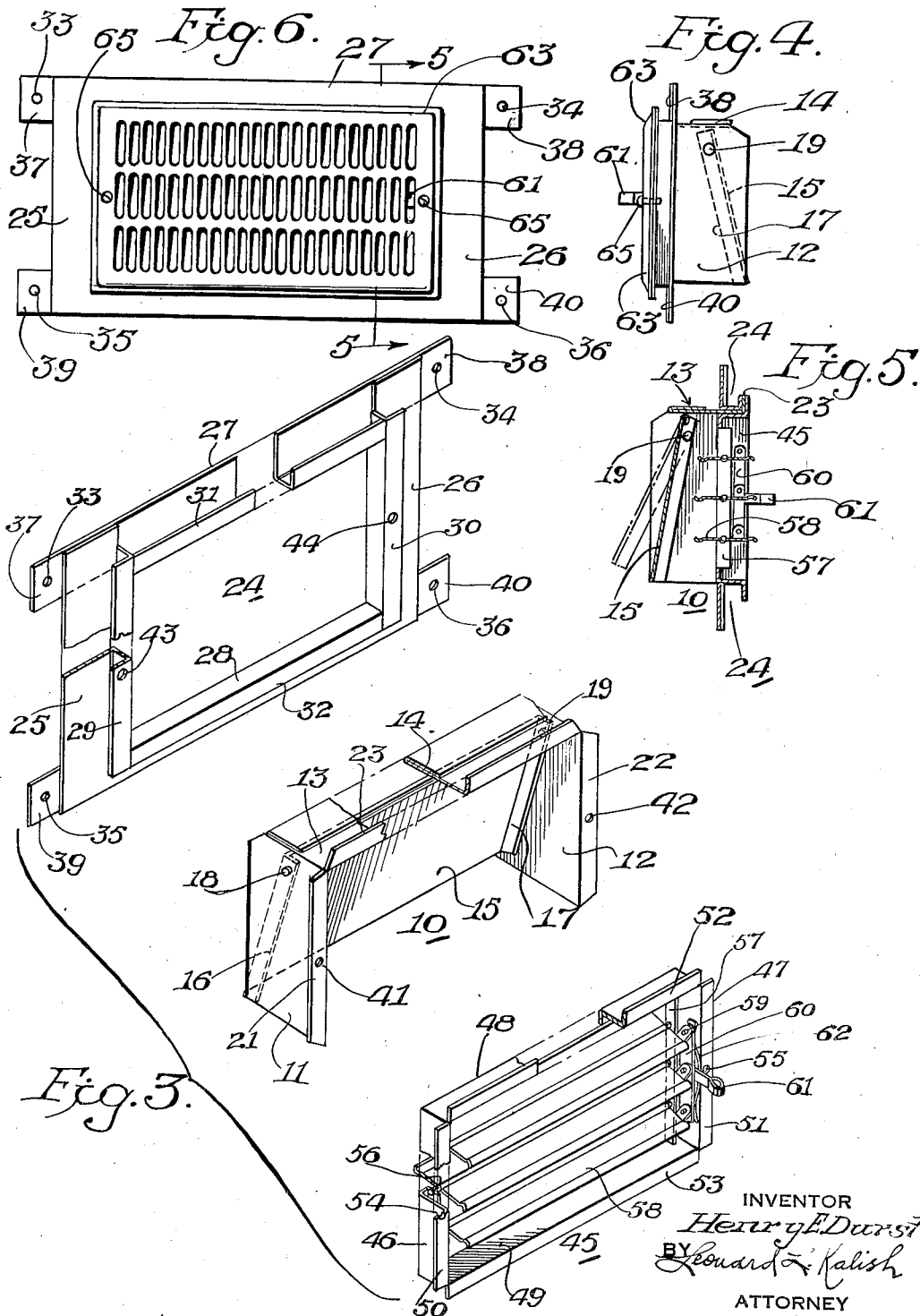
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UNITED STATES PATENT OFFICE

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AIR-FLOW REGULATOR FOR AIR-CONDITIONING SYSTEMS

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1 Claim. (Cl. 98—106)

The present invention relates to certain new and useful improvements in the construction of air-flow regulators particularly for air conditioning, and it relates more particularly to air-flow regulators of the type adapted to be inserted into an upright duct or riser through which the conditioned air (cooled or heated, humidified or dehumidified) may be led into the room and by which not only the inflow may be regulated but through which the relative proportioning of inflow into the successive rooms on the same duct may be controlled more accurately.

With the above and other objects in view which will appear more fully from the following description and accompanying drawings, the present invention consists of an air-flow regulator comprising a generally rectangular frame of a width preferably only a fraction of the width of the duct in which it is to be used, and inwardly extending generally horizontal top wall and inwardly extending generally vertical and parallel side walls, and an adjustable panel disposed between said side walls and hinged to the innermost edge of said top wall and generally completely occupying the space between said two side walls, thereby to form with said side walls and with said top wall an intake chamber whose mouth or inlet at the bottom thereof and also whose volume may be varied by tilting the hinged panel to various angles; the hinged panel being at all times confined between said side walls in all positions thereof.

For the purpose of illustrating the invention, there is shown in the accompanying drawings one form thereof which is at present preferred, since the same has been found in practice to give satisfactory and reliable results, although it is to be understood that the various instrumentalities of which the invention consists can be variously arranged and organized and that the invention is not limited to the precise arrangement and organization of the instrumentalities as herein shown and described.

In the accompanying drawings, in which like reference characters indicate like parts:

Figure 1 represents a fragmentary perspective view showing an air duct of an air-conditioning system having therein several of the air-flow regulators of the present invention on the different floor levels.

Figure 2 represents a section on line 2—2 of Figure 1.

Figure 3 represents a perspective view of the component parts of the device of the present invention shown disassembled.

Figure 4 represents a side elevational view of the device of the present invention.

Figure 5 represents a section on line 5—5 of Figure 6.

Figure 6 represents a front elevational view of the device embodying the present invention.

In the air-conditioning of buildings, particularly dwellings or in domestic building construction, it is customary to run upright air ducts between the partition walls 5 and 6 from floor to floor, as for instance, through the first floor level 7 and second floor level 8. The device of the present invention designated generally by the numeral 9, includes a hood-like portion designated by the numeral 10 having side walls 11 and 12 and top wall 13 which may be formed in continuation of each other of a piece of sheet metal. The top 13 may be folded back upon itself as indicated at 14. The hood 10 is provided with a pivotally mounted and adjustable inner wall 15 having lateral flanges 16 and 17. At a suitable point near the top of the adjustable outer wall 15, pivot pins or rivets 18 and 19 are provided extending through the flanges 16 and 17 and the corresponding side walls 11 and 12, thereby pivotally to secure the adjustable end wall 15 in the hood. The pivots 18 and 19 are preferably spaced below the upper edge of the wall 15, so that by exerting pressure against the wall 15 above the line of the pivots 18 and 19, the adjustable wall 15 may be deflected inwardly or towards the operator, while a similar pressure upon the wall 15 beneath the pivot line will cause a deflection of the wall 15 in the opposite direction.

The flanges 16 and 17 preferably fit snugly between the walls 11 and 12, so as frictionally to retain the adjustable wall 15 of the hood in any position to which it may be set.

The adjustable wall 15, together with the side walls 11 and 12 and the upper wall 13, forms a complete hood for entrapping or diverting air from its flow through the duct 4. The wall 15 may also be pivoted along its uppermost edge.

The hood 10 is so proportioned with respect to the duct 4, that the cross-section of the hood, when in its fully opened position, will be substantially less than, or will be but a fractional part of, the cross-section of the duct 4.

The side walls 11 and 12 and top wall 13 of the hood 10 are preferably provided with lateral flanges 21, 22 and 23.

A frame designated generally by the numeral 24, is preferably, though not necessarily, formed separate from the hood member 10 with its inner dimensions so as to receive the hood. In the

particular illustration herein shown, the frame 24 is formed of vertical members 25 and 26 and horizontal members 27 and 28, each of a generally U-shaped cross-section with the flanges 29, 30, 31 and 32 forming a shorter side of the U. In the particular illustration shown, the vertical and horizontal members are also formed separately and are preferably spot-welded together, and provided with nail holes 33, 34, 35 and 36, through which the frame may be fastened to the vertical studding and to the duct. If desired, lateral extensions 37, 38, 39 and 40 may be provided, preferably formed integrally with either the horizontal or vertical members, and also provided with suitable apertures for fastening to the vertical studding of the wall. This allows for greater variation in the spacing of the studding or permits the frame to be fastened to differently spaced studs.

The hood 10 fits into the frame 24, as indicated generally in Figure 5, and is preferably bolted or otherwise fastened thereto through the apertures 41 and 42 on the flanges 21 and 22 and the corresponding apertures 43 and 44 on the flanges 29 and 30.

A register designated generally by the numeral 45 having the side walls 46 and 47 and the top wall 48 and the bottom wall 49 fits into the hood 10 as indicated generally in Figure 5, and is provided with lateral flanges 50, 51, 52 and 53 which abut the corresponding flanges 21, 22 and 23 of the hood and the flange 32 on the frame, and which may be provided with the apertures 54 and 55 corresponding to the apertures 41 and 42 and the apertures 43 and 44, for retaining the member 45 in place.

Between the intumed vertical pivot flanges 56 and 57, a plurality of shutter plates 58 are pivotally secured in a horizontal position. At one end of each shutter, a lug 59 is formed at a right angle, which is pivoted to a common adjustment link 60 which in turn carries a handle 61 projecting externally and which is frictioned by a suitable flat spring 62, so as to retain the shutter in any position of adjustment.

Any suitable grill plate 63 may be superimposed upon the shutters and fastened through corresponding openings 64 and 65.

By the air-flow regulator of the present invention, the air-conditioning system is adjusted or balanced from floor to floor or room to room by the adjustment of the hood portion without reliance upon the shutters. Thus, the system is permanently adjusted or balanced through the intake hoods 10, while the shutters are merely relied upon for temporary control of any individual room.

A number of regulators of the character here

described may be inserted into a single duct at different levels; each regulator having a horizontal cross-section less than the horizontal cross-section of the duct, so that no one regulator will control the entire duct but will merely divert a part of the flow. Thus, the regulators may be considerably narrower than the width of the duct, or it may be considerably shallower than the depth of the duct as indicated, for instance, in Figure 2, wherein two opposed regulators of the present invention are shown at the same level leading into two different rooms on opposite sides of a partition wall.

By the novel construction herein disclosed, an efficient and inexpensive regulator is provided which will be durable and which will be easy to adjust for the permanent adjustment of the air-conditioning system, and which will retain its aforesaid permanent adjustment indefinitely or until readjusted, and will at the same time always be subject to individual control for every room.

The present invention may be embodied in other specific forms without departing from the spirit or essential attributes thereof, and it is therefore desired that the present embodiment be considered in all respects as illustrative and not restrictive, reference being had to the appended claim rather than to the foregoing description to indicate the scope of the invention.

Having thus described the invention, what is hereby claimed as new and desired to be secured by Letters Patent is:

A room air-flow regulator of the character described comprising a rectangular frame formed from channel shaped members adapted to receive the marginal wall portions defining the outlet within which said regulator may be disposed, a rectangular hood flanged at the outer edges thereof mounted within said frame and including a generally horizontal upper wall and generally vertical side walls, an adjustable air-deflector plate pivotally secured near its upper edge to the side walls of said hood and generally completely occupying the area bounded by said hood walls, said deflector plate being devoid of external adjusting means and having lateral flanges in frictional engagement with said hood side walls, a plurality of readily adjustable shutters, controlling an area generally equivalent to the projected area of said air-deflector plate, disposed at the mouth of said hood substantially in advance of said air-deflector plate, thereby to permit the adjustment of said shutters without hindrance from said deflector plate, and shutter-operating means projecting exteriorly of said shutters and into the room.

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