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AIR DUCT CONTROL FOR HEATING SYSTEMS

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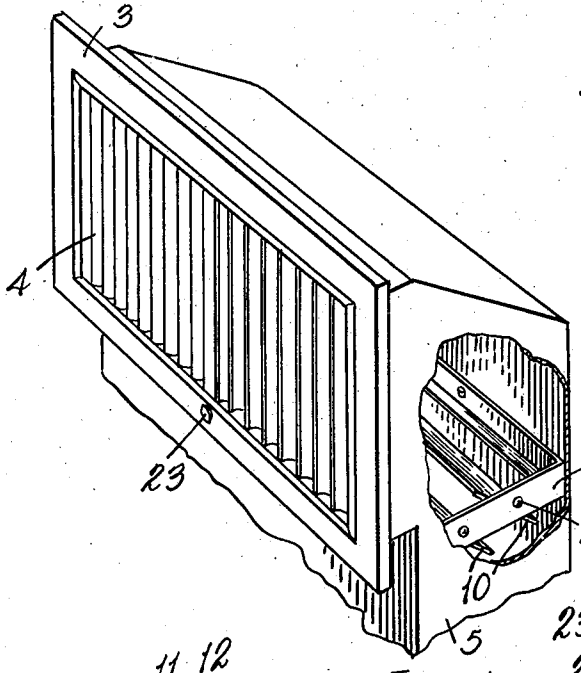


FIG. 1

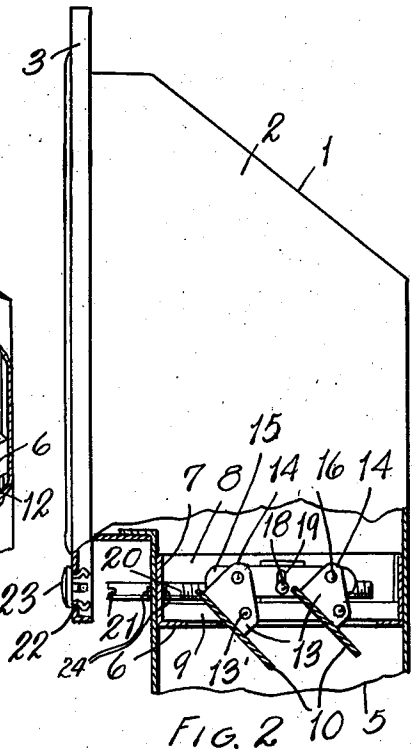


FIG. 2

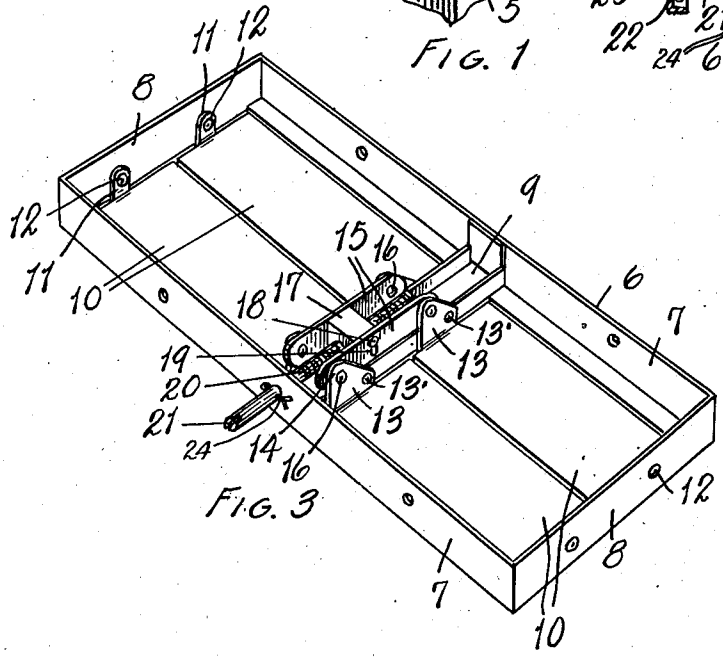


FIG. 3

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AIR DUCT CONTROL FOR HEATING SYSTEMS

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10 Claims. (Cl. 98—107)

This invention relates to improvements in air duct control for heating systems.

It has long been common practice to control air ducts or conduits for hot air heating systems by means of butterfly valves or dampers located near the heating unit. To adjust or balance such a system effectively requires two people, one located at the damper end and the other at the outlet of the conduit to check the flow of air. Furthermore, such adjusting or balancing means are not accurate or exact.

The main objects of this invention are:

First, to provide a control valve for the ducts or conduits of heating systems which can be accurately adjusted to control the delivery through the conduit.

Second, to provide a structure in which one person can effect the adjustment and check the delivery under operating conditions.

Third, to provide a structure having these advantages which is very simple and economical in its parts and at the same time the parts are effectively and adjustably supported.

Objects pertaining to details and economies of the invention will appear from the description to follow. The invention is defined in the claims.

A structure which embodies the features of the invention is clearly illustrated in the accompanying drawing, in which:

Fig. 1 is a fragmentary perspective view of a register housing and associated conduit embodying the features of the invention.

Fig. 2 is a fragmentary side elevation partially in vertical section.

Fig. 3 is a perspective view of the valve unit ready for installation in the conduit.

In the embodiment of the invention illustrated the register designated generally by the numeral 1 is of the wall type, and comprises the housing 2 having a face plate 3 provided with louvers 4. It will be noted that this face plate projects beyond the walls of the housing so as to serve as a finish plate when the register is installed.

The conduit 5 is of rectangular section or at least is preferably provided with a terminal portion of rectangular section. I have not illustrated the connection to the heating unit as that will be readily understood by those skilled in the art, and it will also be understood that commonly there are a number of air ducts or conduits leading from the heating unit to different rooms or spaces to be heated.

The valve unit designated generally by the numeral 6 comprises a rectangular frame, the front and rear members 7 of which are of angular section, the end members 8 being rigidly secured thereto in box-like frame formation. The manner of joining the parts constituting the frame is not illustrated. The frame is provided with a cross piece 9 disposed centrally, this cross piece in the preferred embodiment being of channel section with the channel arranged facing upwardly.

The plate-like valve members 10 are provided with upturned pivot ears 11 at their outer ends pivotally secured at 12 on the end members of the frame. At their inner ends the valve members 10 are provided with upturned ears 13 pivoted at 13' on the flanges of the cross member. These ears 13 are extended upwardly beyond their pivots 13' to provide rocker arms 14. These rocker arms of the pairs of valve members are connected by links 15 disposed on the inner sides of the ears 13 and pivoted thereto at 16.

An adjusting block 17 is slidably supported on the cross piece 9 with the channel of this cross piece constituting a guideway for the block in its sliding movement. The block 17 is disposed between the links 15 and is provided with laterally projecting pins 18 which engage the vertical slots 19 in the links so that as the block is reciprocated on the cross piece, the valve members are opened and closed. They are shown in closed position in Fig. 3 and in partially open position in Fig. 2. The adjusting screw 20 is threaded into the block 17 with its inner end supported thereby and projects through the front piece of the frame and through the wall of the conduit as shown in Fig. 2. The adjusting screw is retained against endwise movement relative to the valve frame 6 by any old and common expedient used for preventing endwise movement of rotary shafts as, for instance, by means of cotter pins 24. These cotter pins extend through the shaft 20 and are disposed one in front of the conduit 5 and another at the rear of the front member 7 of the valve frame 6. The end of the adjusting screw is slotted at 21 to receive a screwdriver to facilitate adjustment.

The frame 3 is provided with a hole 22 alined with the screw to permit access to the screw. The hole is normally closed by the escutcheon plate or slide 23.

My improved control valve is very simple in structure, easily installed, and is strong and rigid, even when formed of relatively light materials. It is positioned so that it can be accurately adjusted to regulate the flow through the individual stacks or conduits. I have not attempted to illustrate embodiments and adaptations which I con-

template as it is believed this disclosure will enable those skilled in the art to embody the invention as may be desirable for the particular installation.

Having thus described my invention what I claim as new and desire to secure by Letters Patent is:

1. The combination with a register housing having a laterally directed discharge provided with a louver-equipped face plate, said face plate projecting below the bottom of the housing, of an air conduit of rectangular section connected to the bottom of said housing to deliver thereto, a rectangular valve frame mounted within said conduit adjacent said register housing, a cross piece of upwardly facing channel section disposed centrally of said frame, plate-like valve members arranged in side by side relation at each side of said cross piece and provided with upwardly projecting pivot ears at the ends thereof pivoted on said cross piece and on the ends of said frame, the ears at the inner ends of said valve members being extended to provide rocker arms, links connecting the rocker arms of said valve members disposed on the inner sides thereof above the flanges of said cross piece, an adjusting block slidable on said cross piece between said links and provided with laterally projecting pins, said links having vertical slots receiving said pins, and an adjusting screw having threaded engagement with said block and extending forwardly through said frame and conduit, the projecting end of said screw being adapted to receive an adjusting tool, said register face plate having a hole therein alined with said adjusting screw.

2. The combination with a register housing, of an air conduit of rectangular section connected to said housing to deliver thereto, a rectangular valve frame mounted within said conduit adjacent said register housing, a cross piece of upwardly facing channel section disposed centrally of said frame, plate-like valve members arranged in side by side relation at each side of said cross piece and provided with upwardly projecting pivot ears at the ends thereof pivoted on said cross piece and on the ends of said frame, the ears at the inner ends of said valve members being extended to provide rocker arms, links connecting the rocker arms of said valve members disposed on the inner sides thereof above the flanges of said cross piece, an adjusting block slidable on said cross piece between said links and provided with laterally projecting pins, said links having vertical slots receiving said pins, and an adjusting screw having threaded engagement with said block.

3. The combination with a register housing having a laterally directed discharge provided with a louver-equipped face plate, said face plate projecting below the bottom of the housing, an air conduit connected to the bottom of said housing to deliver thereto, a valve frame mounted within said conduit adjacent said register housing, a cross piece disposed centrally of said frame, valve members arranged in side by side parallel relation at each side of said cross piece and provided with upwardly projecting pivot ears at the ends thereof pivoted on said cross piece and on the ends of said frame, the ears at the inner ends of said valve members being extended to provide rocker arms, links connecting the rocker arms of said valve members, an adjusting block slidable on said cross piece between said links and operatively connected to said rocker arms, and an adjusting screw having threaded engagement with said block and extending forwardly through said frame and conduit, the projecting end of said screw being adapted to receive an adjusting tool, said register face plate having a hole therein alined with said adjusting screw, said block constituting a support for the inner end of said adjusting screw.

4. The combination with a register housing, of an air conduit connected to said housing to deliver thereto, a valve frame mounted within said conduit adjacent said register housing, a cross piece disposed centrally of said frame, valve members arranged in side by side parallel relation at each side of said cross piece and provided with upwardly projecting pivot ears at the ends thereof pivoted on said cross piece and on the ends of said frame, the ears at the inner ends of said valve members being extended to provide rocker arms, links connecting the rocker arms of said valve members, an adjusting block slidable on said cross piece between said links and operatively connected to said rocker arms, and an adjusting screw having threaded engagement with said block, said block constituting a support for the inner end of said adjusting screw.

5. The combination with a register housing, of an air conduit of rectangular section connected to said housing to deliver thereto, a valve frame mounted within said conduit adjacent said register housing, a cross piece disposed centrally of said frame, valve members arranged in side by side relation at each side of said cross piece and pivotally mounted on said cross piece and on the ends of said frame, the inner ends of said valve members being provided with actuating arms, links connecting the arms of said valve members, an adjusting block slidable on said cross piece and provided with laterally projecting pins, said links having slots receiving said pins, and an adjusting screw having threaded engagement with said block and extending forwardly through said frame and conduit, the projecting end of said screw being adapted to receive an adjusting tool, said register face plate having a hole therein alined with said adjusting screw, said block constituting a support for the inner end of said adjusting screw.

6. The combination with a register housing, an air conduit of rectangular section connected to said housing to deliver thereto, a valve frame mounted within said conduit adjacent said register housing, a cross piece disposed centrally of said frame, valve members arranged in side by side relation at each side of said cross piece and pivotally mounted on said cross piece and on the ends of said frame, the inner ends of said valve members being provided with actuating arms, links connecting the arms of said valve members, an adjusting block slidable on said cross piece and operatively connected to said links, and an adjusting screw having threaded engagement with said block, said block constituting a support for the inner end of said adjusting screw.

7. The combination with a register housing provided with a face plate which projects below the bottom of the housing, of an air conduit connected to deliver to said housing, a valve arranged within said conduit adjacent said register housing and comprising a frame mounted within the conduit, valve members arranged in parallel relation within said frame and pivotally mounted thereon, a sheet metal cross piece of upwardly opening channel cross section connecting opposite sides of said frame, an adjusting block slidably supported in the upwardly facing

channel of said cross piece, operating connections for said block to said valve members whereby the valve members are simultaneously and uniformly adjusted by the adjustment of said block, and an adjusting screw having threaded engagement with said block and extending forwardly from the conduit, the projecting end of the screw being adapted to receive an adjusting tool, said register face plate concealing said adjusting screw but having a hole therein alined with the screw to facilitate its adjustment by means of a tool inserted through the opening.

8. The combination with a register housing, of an air conduit connected to deliver to said housing, a valve arranged within said conduit adjacent said register housing and comprising a frame mounted within the conduit, valve members arranged in parallel relation within said frame and pivotally mounted thereon, a sheet metal cross piece of upwardly opening channel cross section connecting opposite sides of said frame, an adjusting block slidably supported in the upwardly facing channel of said cross piece, operating connections for said block to said valve members whereby the valve members are simultaneously and uniformly adjusted by the adjustment of said block, and an adjusting screw having threaded engagement with said block and extending forwardly from the conduit.

9. The combination with an air conduit of rectangular section, of a valve frame mounted within said conduit adjacent the delivery end thereof, a cross piece disposed centrally of said frame, sets of valve members arranged in side by side relation on opposite sides of said cross piece and pivotally mounted thereon and on the ends of the frame, the inner ends of said valve members being provided with actuating arms, links connecting the actuating arms of the sets of valve members, an adjusting member slidably supported by said cross piece and operatively connected to said links, and an adjusting screw having threaded engagement with said adjusting member and projecting from said conduit, said adjusting member constituting a support for the inner end of said adjusting screw.

10. The combination with an air conduit of rectangular section, of a valve frame mounted within said conduit adjacent the delivery end thereof, a cross piece disposed centrally of said frame, sets of valve members arranged on opposite sides of said cross piece and pivotally mounted thereon and on the ends of the frame, the inner ends of said valve members being provided with actuating arms, an adjusting member slidably supported by said cross piece and operatively connected to said arms, and an adjusting screw having threaded engagement with said adjusting members and projecting from said conduit, said adjusting member constituting a support for the inner end of said adjusting screw.

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