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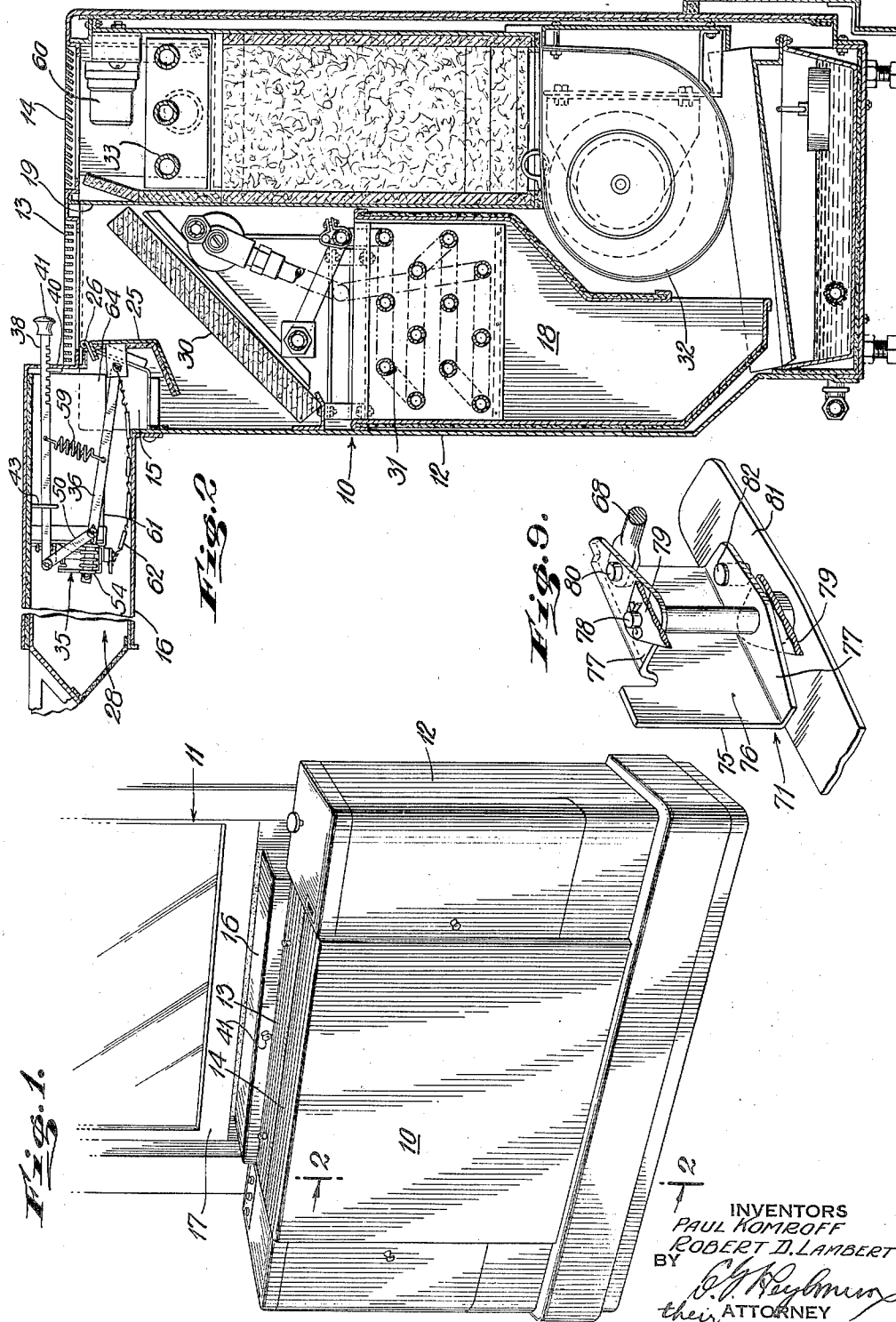
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2,235,023

AIR CONDITIONING APPARATUS

Filed Oct. 21, 1937

3 Sheets-Sheet 1



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AIR CONDITIONING APPARATUS

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3 Sheets-Sheet 2

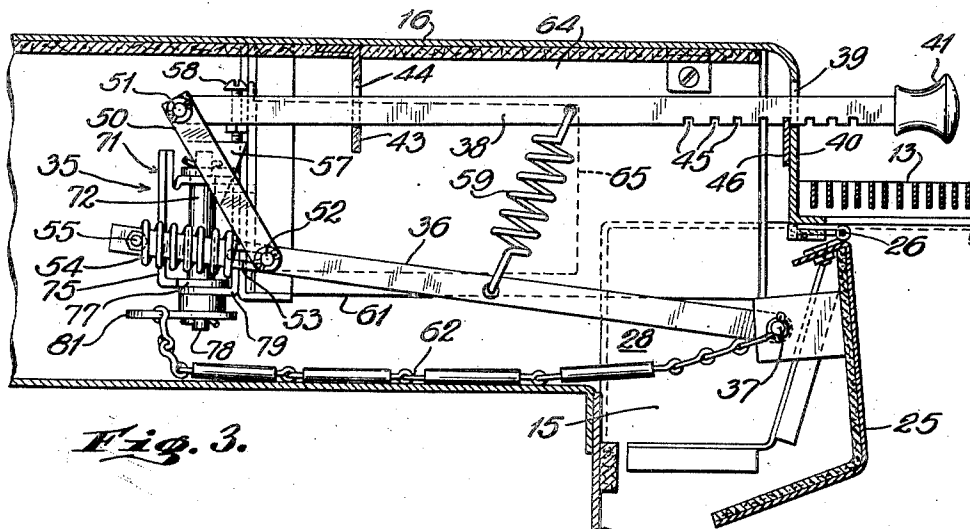


Fig. 3.

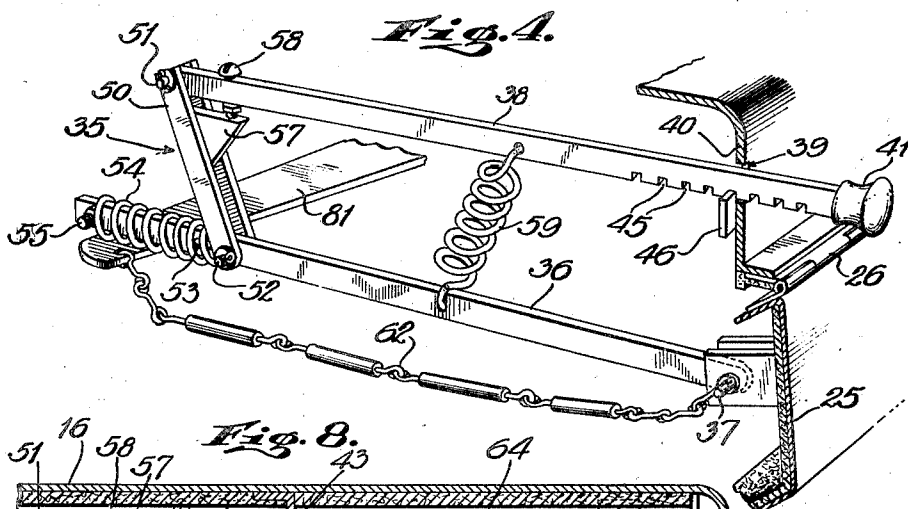


Fig. 4.

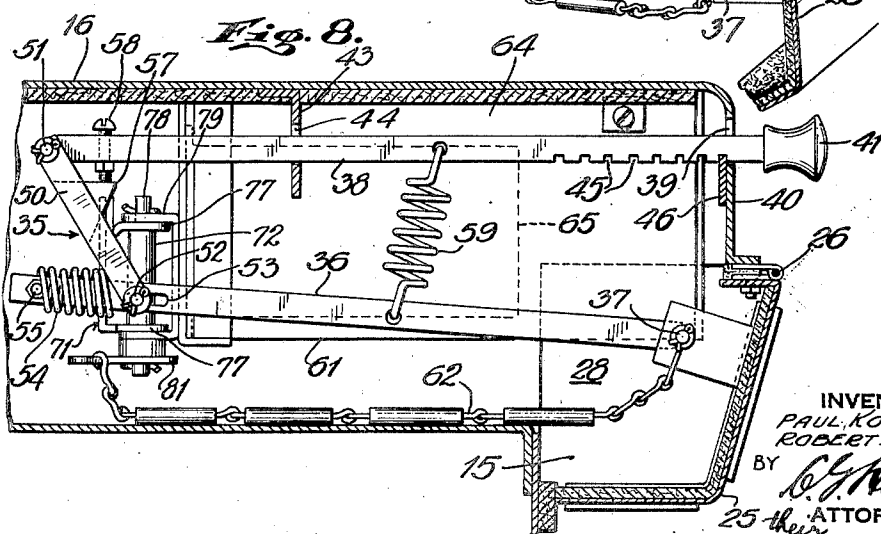


Fig. 8.

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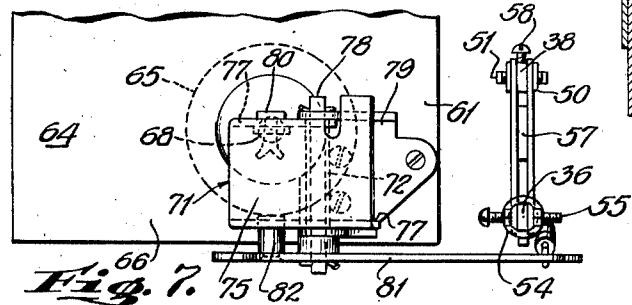
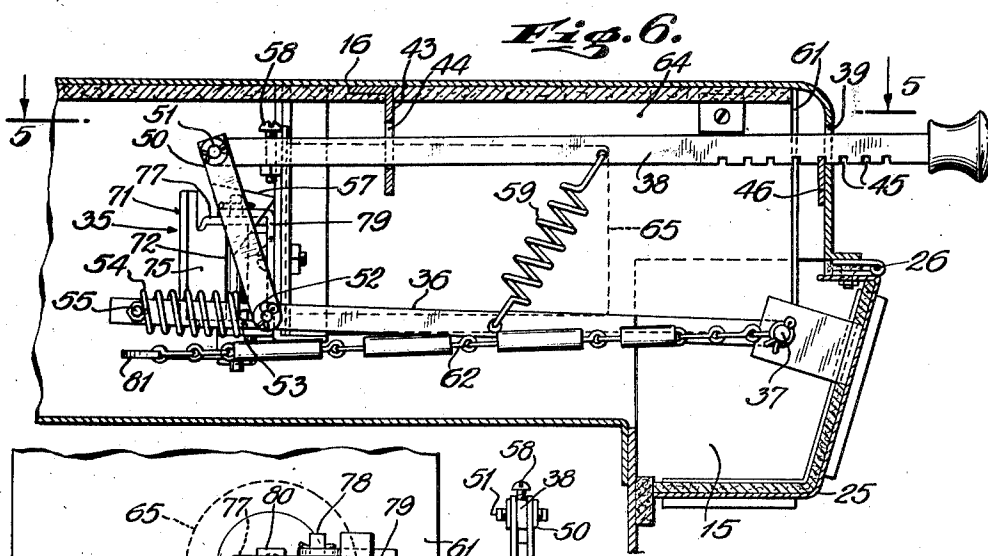
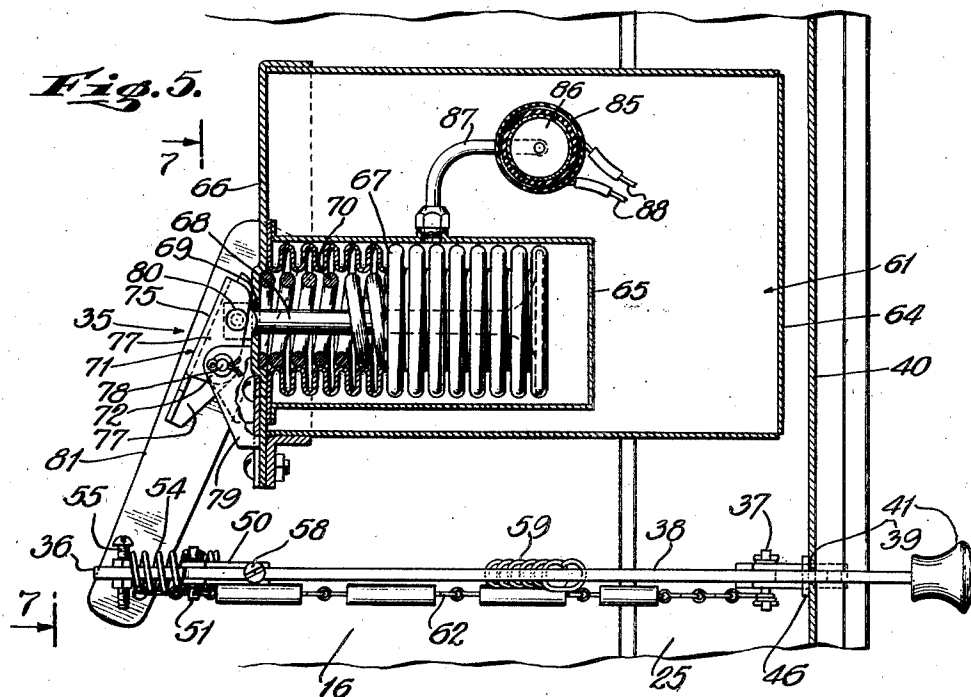
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AIR CONDITIONING APPARATUS

Filed Oct. 21, 1937

3 Sheets-Sheet 3



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## UNITED STATES PATENT OFFICE

2,235,023

## AIR CONDITIONING APPARATUS

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Application October 21, 1937, Serial No. 170,168

7 Claims. (Cl. 98—38)

Our invention relates to air conditioning apparatus, and more particularly to improvements in mechanisms for operating dampers which control the flow of air through such apparatus; the present case being directed to the same general type of apparatus as is disclosed and claimed broadly in the U. S. Patent No. 2,209,800, granted July 30, 1940, to Matson C. Terry.

The invention consists in the novel construction and combination of parts, to be more fully described hereinafter, and the novelty of which will be particularly pointed out and distinctly claimed.

In the accompanying drawings, to be taken as a part of this specification, we have fully and clearly illustrated a preferred embodiment of our invention, in which drawings—

Fig. 1 is a perspective view showing air conditioning apparatus of the room-unit type in which our improvement is embodied;

Fig. 2 is a transverse vertical sectional view through the apparatus shown in Fig. 1, the view being taken on the line 2—2 of Fig. 1 and being on an enlarged scale;

Fig. 3 is a fragmentary vertical section taken on the same plane as Fig. 2 and showing the damper and its operating mechanism on an enlarged scale;

Fig. 4 is a fragmentary perspective view with parts in section, showing more clearly the details of the damper and its operating mechanism;

Fig. 5 is a fragmentary plan sectional view taken on the line 5—5 of Fig. 6;

Fig. 6 is a view similar to Fig. 3, showing the relative position of the parts when the damper is automatically closed due to the non-operation of an air conditioning means;

Fig. 7 is a fragmentary vertical sectional view taken on the line 7—7 of Fig. 5;

Fig. 8 is a view similar to Figs. 3 and 6, showing the relative position of the parts when the damper is closed manually; and

Fig. 9 is a perspective view with parts in section, showing in detail the structure of the composite lever for closing the damper when the air conditioning means is not operating.

Referring now in detail to the construction illustrated, and particularly to Figs. 1 and 2, it will be observed that we have shown our improvement as embodied in an air conditioning unit of the type which is adapted to be installed in a room space and adjacent a window opening in an outside wall thereof. The unit is indicated in general by the reference numeral 10, and the window by the numeral 11.

The unit 10 comprises a casing 12 having a

room air inlet opening 13 in the top wall and at the rear thereof, and an air outlet opening 14 in the top wall and at the front thereof. The casing 12 is also provided with an outdoor air inlet opening 15 in the upper and rear part thereof, which communicates with one end of a horizontally and rearwardly extending outside air duct 16, and the outer end of the duct 16 being open and adapted to communicate with the outside atmosphere through the opening defined by a partially raised sash 17 of the window 11.

Connecting the inlet openings 13 and 15 and the outlet opening 14, is a U-shaped passage 18 which is defined by the outer walls of the casing 12 and by a partition 19 depending from the top wall of the casing 12 between the inlet opening 13 and outlet opening 14, and stopping short of the bottom part of the casing so as to provide the return bend in the lower part of the passage.

Arranged in the upper rear part of the U-shaped passage 18 and adjacent the inner open end of the duct 16, is a damper 25 which is pivotally supported, as indicated at 26, between the inlet openings 13 and 15, and may be moved about its pivotal support between two extreme positions, one of which closes the inlet opening 15 and opens the inlet opening 13, and the other of which closes the inlet opening 13 and opens the inlet opening 15. As will appear more fully hereinafter, the damper 25 may be positioned at any preselected point between these two extreme positions to proportion the amounts of room air and outside air entering the U-shaped passage 18 through the inlet openings 13 and 15 respectively.

It is to be observed at this point that while the damper 25 has just been described as a proportioning damper, it is also correct to consider the damper as closing and opening the outside air inlet opening 15, and also to consider the opening 15 as a part of a passage 28 connecting the outside atmosphere with the room, such passage 28 being formed in part by the duct 16 and in part by the U-shaped passage 18. In the latter sense, the damper 25 opens and closes the passage 28 and thereby regulates the amount of air flowing through said passage 28.

Arranged below the damper 25 and across the passage 28 and U-shaped passage 18, is a suitable filter 30 which may be removably supported for ready replacement and which serves to remove from the air flowing through the passage 28 and its part 18, foreign particles, such as dust, dirt, pollen and the like. Arranged below the filter 30, is a cooling coil 31, which when operating serves to lower the temperature of the

air flowing through the passage 18. The cooling coil may be of any suitable construction. The one here shown is of the direct expansion type through which a suitable refrigerant, such, for example, as sulphur dioxide or Freon, is circulated.

Arranged in the lower part of the U-shaped passage 18 is a motor-driven blower unit 32 which provides for the positive flow of air through the passage 28 and into the room through the outlet opening 14. Arranged above the blower 32 and just below the outlet opening 14 is a heating device 33, here shown to be a conventional type of heating coil through which a suitable heating fluid, such, for example, as hot water or steam, is circulated.

In the warmer months of the year when the temperature of the outside atmosphere is above the comfort range of the room space in which the unit 10 is located, the refrigerant is supplied to the coil 31 and air flowing through the passage 28 and into the room is reduced in temperature so as to produce a desired comfort condition in the room space. During the colder months of the year when the temperature of the outside air is below that of the room space, then the supply of refrigerant is shut off from the coil 31 and heating fluid is supplied to the coil 33 and the temperature of the air flowing through the passage 28 is raised to a point where it will produce a comfortable condition in the room space.

In accordance with the present invention, we have provided an improved mechanism for operating the damper 25, whereby the amount of outdoor air flowing into the room through the unit 10 may be regulated. Regulation is required both in summer and in winter so that the room space will be properly ventilated, and also so that the amount of ventilation can be proper adjusted with respect to the operation of the cooling or heating units to maintain a desired temperature condition in the room space.

Referring now to Figs. 2 to 9 inclusive of the drawings, it will be noted that the damper-operating mechanism is indicated in general by the reference character 35, and comprises a first rod 36 which is pivotally connected at one end by a pin 37 to the damper 25 at points spaced from the pivot 26, so that the rod 36 and damper 25 will move together. The mechanism 35 also comprises a second rod 38, one end of which extends forwardly through a vertical slot or opening 39 in a front vertical wall part 40 of the duct 16, and the extreme forward end of the rod 38 has a knob 41 which may be grasped by hand for moving the rod lengthwise. The other or rear end of the rod 38 extends rearwardly into the duct 16 and in the same general direction as the first rod 36. As shown, the rods 36 and 38 are arranged substantially parallel to one another. The second rod 38 is supported for lengthwise movement by a suitable bracket 43 having a vertical opening or slot 44 therein. The forward end of the rod moves lengthwise through the opening 39.

At the forward end of the rod 38 and in the underside thereof is provided a series of spaced notches 45, and at the bottom of the opening 39 and on the inside surface of the wall part 40 is fixed a plate 46 which extends slightly above the bottom of the opening 39 and is adapted to engage any desired one of the notches 45 and thereby secure or lock the rod 38 against lengthwise movement at any desired preselected position. When it is desired to move the rod 38

lengthwise to a new position, the forward end of the rod may be simply raised by grasping the knob 41 and the particular notch 45 disengaged from the plate 46, and the rod may then be moved at will forwardly or rearwardly. The opening 39 is of sufficient height to permit the necessary clearance between the notches 45 and plate 46 when the rod is lifted.

The mechanism 35 also comprises a link 50 connecting the first and second rods 36 and 38 at the rear ends thereof. The link 50 is pivotally connected to the rear end of the second rod 38 by a suitable pin 51, and is pivotally connected to the rear end of the rod 36 by a pin 52 extending transversely through a slot 53 formed in the first rod 36 and extending lengthwise thereof. A compression spring 54 engaging at one end an abutment formed by a transverse pin 55 in the rear end of the rod 36, and engaging at the other end the lower part of the link 50, serves to hold the pin 52 tightly against the forward end of the slot 53 (see Figs. 3 and 4). The purpose of the lost-motion connection provided by the pin 52, slot 53 and spring 54, will appear more fully hereinafter.

Fixed to the connecting link 50 and projecting forwardly at the side thereof adjacent the damper is an abutment 57 which is adapted to engage the lower end of an adjusting screw 58 which, functionally, is a part of the rod 38. The screw 58 extends through a threaded opening in the rod 38 and serves to secure the proper positional relationship between parts. When the abutment 57 is in engagement with the screw 58, relative movement is prevented between the link 50 and rods 36 and 38, should the rod 38 be moved in a damper-closing direction, and should the rod 36 be moved in a damper-opening direction.

The mechanism 35 also includes a tension spring 59 connecting the rods 36 and 38 at points spaced forwardly from the link 50. The spring 59 is so arranged that it functions to urge the rod 36, damper 25 and link 50 forwardly with respect to the rod 38, and thereby effect engagement between the abutment 57 and the screw 58 which, as stated, is a functional part of the rod 38. This is made possible, due to the fact that the spring 59 and link 50 are inclined toward one another in the direction extending toward the rod 36. It will be apparent that as the spring 59 holds the abutment 57 tightly against the screw 58 of rod 38, the parts are held together as a unit and the damper may be moved to any preselected position by the manual lengthwise movement of the rod 38.

Figs. 2, 3 and 4 show the relative position of parts when the rod 38 is adjusted to position the damper so as to partially open the inlet opening 15. Fig. 8 shows the relative position of the parts when the rod 38 is adjusted to close the damper 25. In Fig. 8, it will be observed that the forward notch 45 on the rod 38 engages the plate 46, and that the pin 52 is spaced from the forward end of the slot 53. The purpose of the lost-motion connection provided by the pin 52, slot 53 and spring 54, is to permit the rod 38 to be moved inwardly beyond the point where the damper 25 is closed and against the force of the spring 54. The spring 54 will then serve to hold the damper tightly in its closed position. This construction is advantageous because a tight closing of the damper may always be assured without the necessity of extreme accuracy

in manufacture, assembly and adjustment of the rods 36 and 38 and the link 50.

In accordance with the present invention, we also provide as a part of the mechanism 35, a means which acts in response to an operating characteristic of an air conditioning element for automatically closing and opening the damper 25 and thereby regulating the amount of outdoor air flowing through the passage 28. In the illustrated embodiment of our invention, we have shown this means as including a thermostat 60 which acts in response to the temperature of the air flowing from the heating coil 33 to control the operation of a heat motor 61, the latter being operatively connected to the damper by a suitable chain 62 (see Fig. 5).

The operation of the means just referred to is such that when the temperature of the air passing from the heating coil 33 falls below a predetermined minimum, the heat motor 61 operates to pull the chain 62 taut and close the damper 25 against the force of the spring 59. The heat motor 61 will hold the damper tightly closed until the temperature of the air flowing from the coil 33 rises above the aforementioned predetermined minimum. When the latter occurs, the heat motor acts to release the damper 25 and the spring 59 returns the damper to a position determined by the preselected secured position of the rod 38.

The heat motor is enclosed within a housing 64 supported by a wall of the duct 16, and comprises a cylinder 65 secured to a wall 66 of the housing 64, an expansible metallic bellows 67 located within the cylinder 65 and fixed at one end to the wall 66, a rod 68 fixed at one end to the movable end of the bellows 67 and the other end extending through an opening 69 in the wall 66, and a compression spring 70 encircling the rod 68 and abutting at one end the wall 66 and at the other end the movable end of the bellows (see Figs. 5 and 7).

The heat motor 61 also comprises a composite lever 71 which is fulcrumed intermediate its ends as indicated at 72 and is pivotally connected at one end to the outer end of the rod 68 (see also Fig. 9). The other end of the lever is connected by the flexible chain 62 with the damper 25. The composite lever 71 comprises an element 75 including a web portion 76 and lateral right-angle flanges 77. The flanges 77 receive a pin 78 which forms a part of the fulcrum 72, and is supported from the wall 66 by spaced brackets 79. The outer end of the rod 68 is secured by a suitable pin 80 to one of the flanges 77. The composite lever also comprises an element 81 pivotally mounted on the fulcrum pin 78, and secured to the element 75 by a pin 82 passing through the element 81 and one of the flanges 77 of the element 75. The flexible chain 62 is connected at one end to the outer end of the element 81, and is connected at the other end to the pin 37 carried by the damper 25.

The heat motor also comprises an electrical heating element 85 encircling a small chamber 86 positioned in the housing 64, and the chamber is connected to the cylinder 65 by a small tube 87. The chamber 86, tube 87 and the space in the cylinder 65 outside of the bellows 67, are adapted to be filled with any suitable expansible fluid, such, for example, as ethyl chloride, sulphur dioxide, ether, or the like.

The electrical heating element 85 is connected in an electrical circuit with the thermostat 60 by suitable conductors 88. The thermostat 60 may

be of any suitable construction, depending upon the type of control desired. The one here shown operates to close the electrical circuit when the temperature of the air engaging the thermostat is above a predetermined point, and to open the circuit when the temperature of the air falls below the predetermined point.

When the thermostat 60 closes the electrical circuit, the heating element 85 is energized, which results in the vaporization of the fluid in the chamber 86, tube 87 and cylinder 65, and in the compression of the bellows 67. As the bellows is compressed, the rod 68 moves outwardly of the housing 64 against the force of the compression spring 70 and moves with it the lever 71 in a direction to put slack in the chain 62 and permit the spring 59 to move the damper to the position preselected by hand adjustment of the rod 38. When the thermostat 60 opens the electrical circuit, the element 85 is deenergized. This will result in the contraction of the expansible fluid in the chamber 86 and in the compression spring moving the bellows 67 back to its fully extended position, and moving with it the rod 68 and lever 71 and pulling the chain 62 taut and closing the damper 25.

In the embodiment illustrated, the normal condition is the one where a heating fluid is supplied to the coil 33. As stated previously, when heat is in the coil 33, the thermostat 60 is closed and the heating element 85 is energized and the damper 25 opened. This position is the one shown in Figs. 2, 3 and 4 of the drawings. With the parts in this position, the damper 25 may be moved to any new position by simply moving the rod 38 forwardly or rearwardly by hand in the manner previously explained. Should the supply of heating fluid be shut off for any reason, the thermostat 60 will open the circuit, deenergize the heating element 85, and close the damper in the manner before explained. The closed position is shown in Figs. 5 and 6 of the drawings. It will be noted from an examination of Fig. 6 that the abutment 57 has been moved away from the screw 58 of rod 38. With the heating element 85 deenergized, the damper cannot be opened. However, the position to which the damper will move when the heating element again becomes energized, can be changed by moving the rod 38 in or out in the manner explained previously. This is permitted, due to the spring and link connection between the rod 36 and the rod 38.

From the above, it is apparent that we have provided a mechanism which permits the damper to be accurately adjusted by hand to any preselected position, and which at the same time provides for the automatic closing of the damper in response to changes in an operating characteristic of an air conditioning element. While we have shown the mechanism 35 as operating in response to the temperature of the heating coil 33, it is to be noted that the invention is not limited in all of its aspects to this particular arrangement; for, insofar as the broader aspects of the invention are concerned, the mechanism 35 may operate in response to an operating characteristic of the cooling coil 31; or, still further, it may operate in response to a thermostat in the room, which may be subject to temperature changes produced by the operation of either or both heating coil and the cooling coil.

The expression "an operating characteristic of the air conditioning element or means" as used herein and in the appended claims, is intended

to mean any condition which reflects the operation of the air conditioning means; that is to say, any condition which indicates or shows whether or not the air conditioning means is operating, or its degree of operation, or the air conditioning effect produced by the air conditioning means because of its operation. One example of an operating characteristic of the air conditioning means would be the temperature of the air leaving the heating coil 33, as described above. The temperature of the air leaving the coil changes with the heat output of the coil and thereby indicates whether or not the coil is operating. Other examples of operating characteristics of an air conditioning means would be the surface temperature of a heating or cooling coil; the temperature of a heating or cooling medium flowing through a heating or cooling coil; the rate of flow of a cooling or heating medium through a coil; and the pressure of the fluid inside of a coil as in the case of a steam coil and in the case of a refrigerant in a cooling coil. Obviously, any operating characteristic of the air conditioning means may be used as a source of control for the opening and closing of the damper 25, without departing from the intended scope of the present invention.

It is advantageous to have a damper which may be adjusted at will to regulate accurately the amount of outdoor air flowing into a room which is being air conditioned. In the winter time, the amount of outdoor air entering the room has a direct effect on the ability of the heating coil to maintain a desired temperature in the room, and should the heating coil fail to operate, it would be desirable to close the outdoor air inlet so that the comfortable condition could be maintained in the room, and so as to prevent cold drafts. Furthermore, continued flow of cold outside air might damage the unit by freezing the water-filled parts therein.

The apparatus described above can perform these desired functions in an admirable manner. The position of the damper may be easily and quickly adjusted, and the mechanism for positioning the damper does not interfere in any way with the automatic closing and opening of the damper when required. The two rods 36 and 38, the link 50, with the abutment 57 and the tension spring 59, make the performance of these functions possible.

What we claim and desire to secure by Letters Patent of the United States is:

1. In air conditioning apparatus, means defining an air passage; means for changing the condition of the air flowing through said passage; a damper movable between closed and open positions for regulating the flow of air through said passage; a first rod connected at one end to the damper and movable lengthwise with the damper; a second rod extending in the same general direction as said first rod and spaced therefrom and movable lengthwise by hand; means for securing said second rod against lengthwise movement at any one of a plurality of positions; a connecting link pivoted at one end to the first rod and pivoted at its other end to the second rod; abutment means on said link and adapted to engage one of said rods and prevent relative movement therebetween when said first rod is moved in a damper-opening direction and when said second rod is moved in a damper-closing direction; means for constantly urging said abutment into said engagement with the rod so that the first and second rods and connecting link are

normally held together for movement as a unit for adjusting the position of the damper; and means acting in response to changes in an operating characteristic of said air conditioning means for moving said damper in a closing direction against the force of said urging means upon a given reduction in output of said air conditioning means.

2. In air conditioning apparatus, means defining an air passage; means for changing the condition of the air flowing through said passage; a damper movable between closed and open positions for regulating the flow of air through said passage; a first rod connected at one end to the damper and movable lengthwise with the damper; a second rod extending in the same general direction as said first rod and spaced therefrom and movable lengthwise by hand; means for securing said second rod against lengthwise movement at any one of a plurality of positions; a connecting link pivoted at one end to the first rod and pivoted at its other end to the second rod; abutment means on said link and adapted to engage one of said rods and prevent relative movement therebetween when said first rod is moved in a damper-opening direction and when said second rod is moved in a damper-closing direction; means for constantly urging said abutment into said engagement with the rod so that the first and second rods and connecting link are normally held together for movement as a unit for adjusting the position of the damper; and means for closing said damper against the force of said urging means when said condition-changing means is not operating and permitting said urging means to open said damper to a point determined by the preselected secured position of said second rod when the condition-changing means is operating.

3. In air conditioning apparatus, means defining an air passage; means for changing the condition of the air flowing through said passage; a damper movable between closed and open positions for regulating the flow of air through said passage; a first rod connected at one end to the damper and movable lengthwise with the damper; a second rod arranged in spaced substantially parallel relation with the first rod and movable lengthwise by hand; means for securing said second rod against lengthwise movement at any one of a plurality of points; a connecting link pivotally connected at its ends to said first and second rods, respectively; abutment means on the side of said link which is adjacent said damper and adapted to engage said second rod and prevent relative movement therebetween when said first rod is moved in a damper-opening direction and when said second rod is moved in a damper-closing direction; a tension spring connecting said first and second rods at points spaced from said link and between the link and damper and extending in an inclined direction with respect to said rods so as to constantly urge said abutment means into engagement with said second rod, and so that the first and second rods and connecting link are normally held together for movement as a unit for adjusting the position of the damper; and means for closing said damper against the force of said spring when said condition-changing means is not operating and permitting said spring to open said damper to a point determined by the preselected secured position of said second rod when the condition-changing means is operating.

4. In air conditioning apparatus, means de-

fining an air passage; means for changing the condition of the air flowing through said passage; a pivoted damper movable between open and closed positions for regulating the flow of air through said passage; a first rod pivotally connected at one end to said damper at points spaced from the pivotal axis and extending away from the latter in a direction transverse to the pivotal axis so that the rod may be moved lengthwise for opening and closing the damper; a second rod spaced from said first rod and extending from points adjacent said damper in the same general direction as said first rod; means providing for lengthwise movement of said second rod by hand and for securing said second rod against lengthwise movement at any one of a plurality of positions; a connecting link pivoted at one end to the first rod and pivoted at its other end to the second rod; abutment means on said link and adapted to engage one of said rods and prevent relative movement therebetween when said first rod is moved in a damper-opening direction and when said second rod is moved in a damper-closing direction; means for constantly urging said abutment into said engagement with the rod so that said first and second rods and said connecting link are normally held together for movement as a unit for adjusting the position of the damper; and means for closing said damper against the force of said urging means when said condition-changing means is not operating and permitting said urging means to open said damper to a point determined by the preselected secured position of said second rod when the condition-changing means is operating.

5. In air conditioning apparatus, means defining an air passage; means for changing the condition of the air flowing through said passage; a damper movable between closed and open positions for regulating the flow of air through said passage; a first rod connected at one end to the damper and movable lengthwise with the damper; a second rod extending in the same general direction as said first rod and spaced therefrom and movable lengthwise by hand; means for securing said second rod against lengthwise movement at any one of a plurality of positions; a connecting link pivoted at one end to the first rod and pivoted at its other end to the second rod; abutment means on said link and adapted to engage one of said rods and prevent relative movement therebetween when said first rod is moved in a damper-opening direction and when said second rod is moved in a damper-closing direction; a tension spring connecting said rods at points spaced from said connecting link and extending in an inclined direction with respect to said rods so as to constantly urge said first rod, connecting link and damper to move in a damper-opening direction and effect said engagement between the abutment means and one of said rods, whereby movement of said second rod by hand will result in said link, said first rod and said damper moving therewith as a unit; and means connected to said damper for closing the latter against the force of said spring when said conditioning means fails to operate and permitting said spring to return the damper to the position determined by the preselected secured position of said second rod when said conditioning means operates again.

6. In air conditioning apparatus, means defining an air passage; means for changing the condition of the air flowing through said pas-

sage; a damper movable between closed and open positions for regulating the flow of air through said passage; first and second rods arranged in spaced substantially parallel relation; said first rod being connected at one end to said damper for lengthwise movement therewith and said second rod being movable lengthwise by hand to any one of a plurality of positions; means for securing said second rod against lengthwise movement at any of said positions; a link connected at its ends to said first and second rods, respectively, a tension spring also connecting said rods and at points spaced from the link and at the damper side of the latter; abutment means on said link and on the side thereof adjacent said spring and adapted to engage said second rod; said link and said spring being inclined toward one another in the direction extending toward said first rod so that the spring tends to hold said abutment means against said second rod and so that normally, said first rod, link and damper may be moved manually as a unit with said second rod for positioning the damper; and means for closing said damper against the force of said spring when said condition-changing means is not operating and permitting said spring to open said damper to a point determined by the preselected secured position of said second rod when the condition-changing means is operating.

7. In air conditioning apparatus, means defining an air passage; means for changing the condition of the air flowing through said passage; a damper movable between closed and open positions for regulating the flow of air through said passage; a first rod connected at one end to the damper and movable lengthwise with the damper; a second rod extending in the same general direction as said first rod and spaced therefrom and movable lengthwise by hand; means for securing said second rod against lengthwise movement at any one of a plurality of separate and distinct positions; a connecting link; a pivotal connection between one end of said link and one of said rods and a second pivotal connection between the other end of said link and the other of said rods; abutment means on said link and adapted to engage one of said rods and prevent relative movement therebetween when said first rod is moved in a damper-opening direction and when said second rod is moved in a damper-closing direction; means for constantly urging said abutment into said engagement with the rod so that the first and second rods and connecting link are normally held together for movement as a unit for adjusting the position of the damper; one of said pivotal connections comprising a lost-motion connection including a spring for taking up the lost motion and being so constructed that said second rod can move after the damper is closed in a damper-closing direction and against the force of the spring, and can be secured at a position past the point where the damper is closed with the spring holding the damper tightly closed; and means for closing said damper against the force of said urging means when said condition-changing means is not operating and permitting said urging means to open said damper to a point determined by the preselected secured position of said second rod when the condition-changing means is operating.

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