

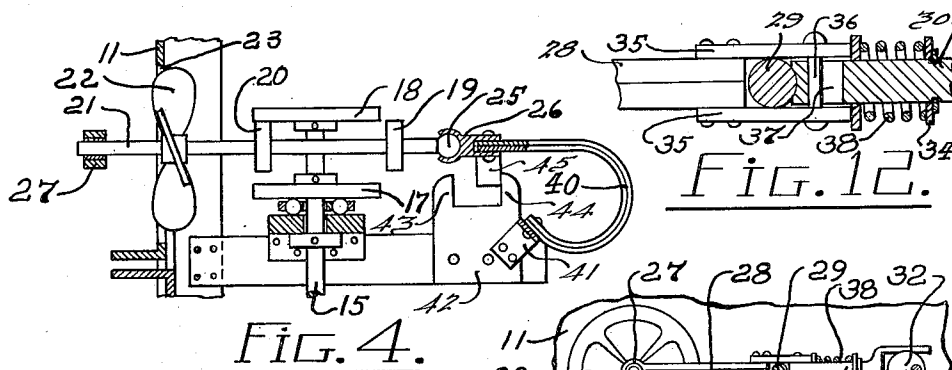
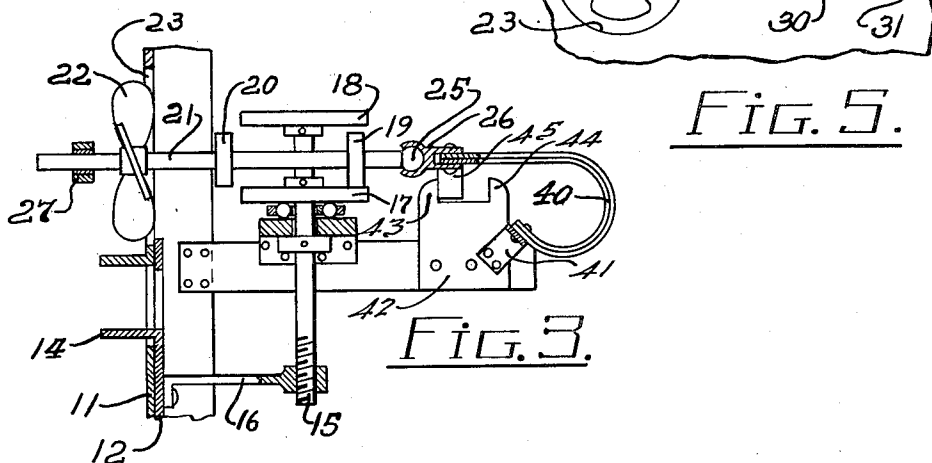
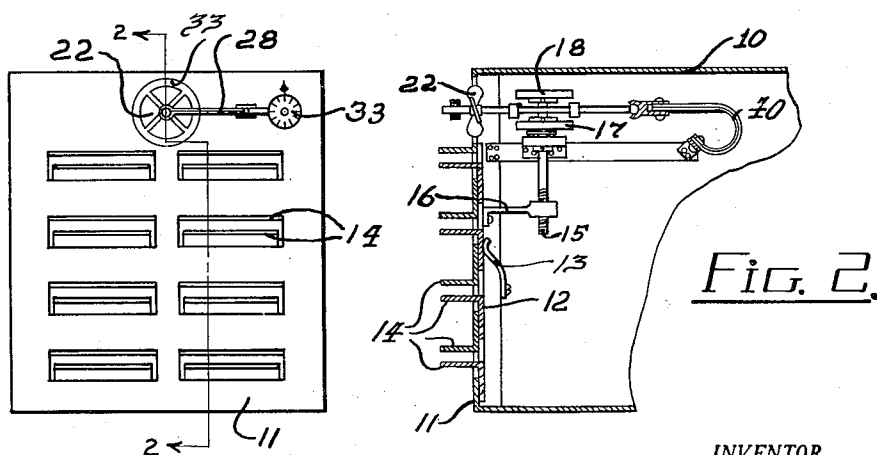
Dec. 5, 1950

A. B. NEWTON
AIR CONTROLLING GRILLE

2,533,175

Filed Jan. 3, 1947

3 Sheets-Sheet 1



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3 Sheets-Sheet 2

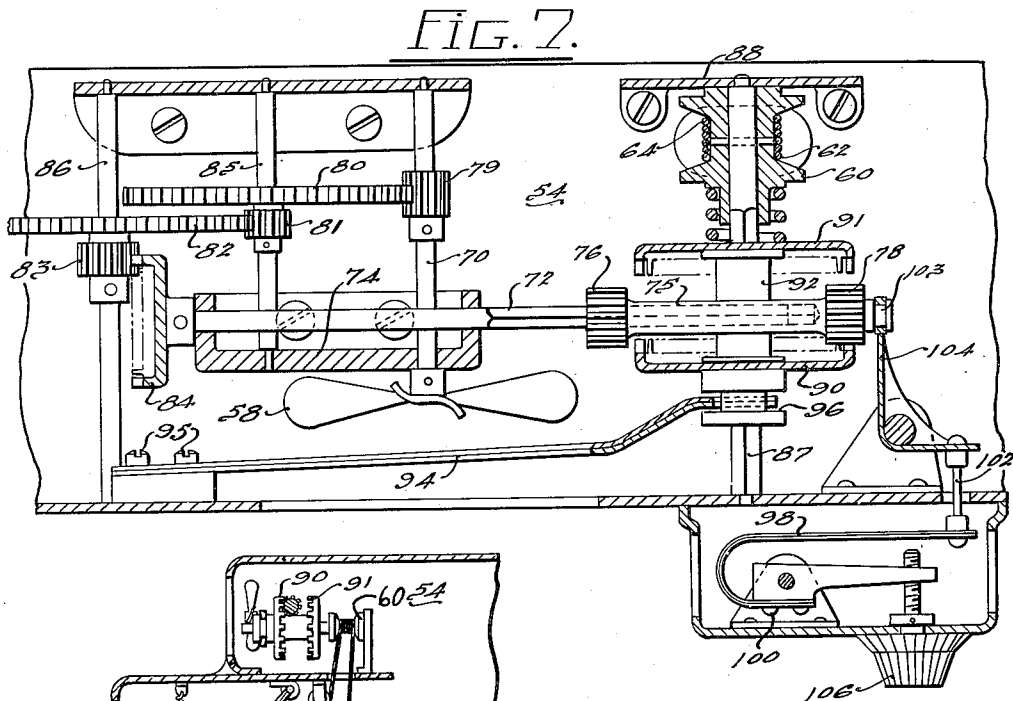
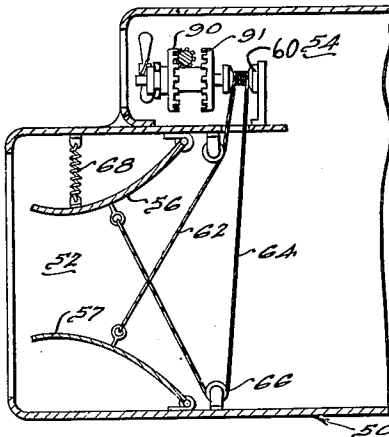


FIG. 8.

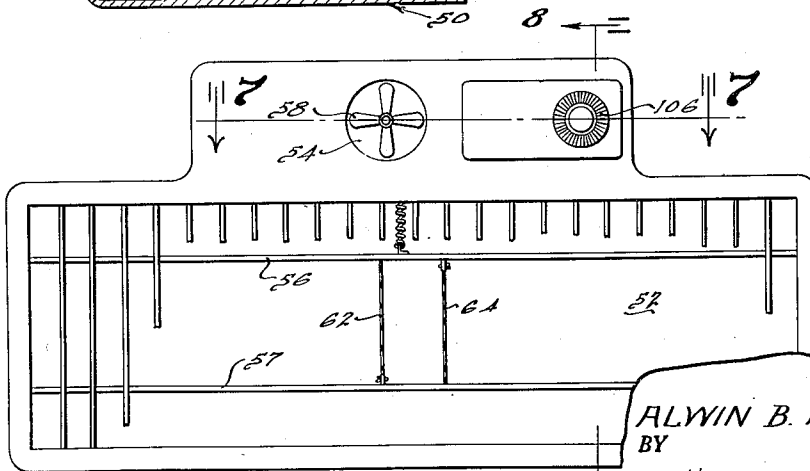


FIG. 9.

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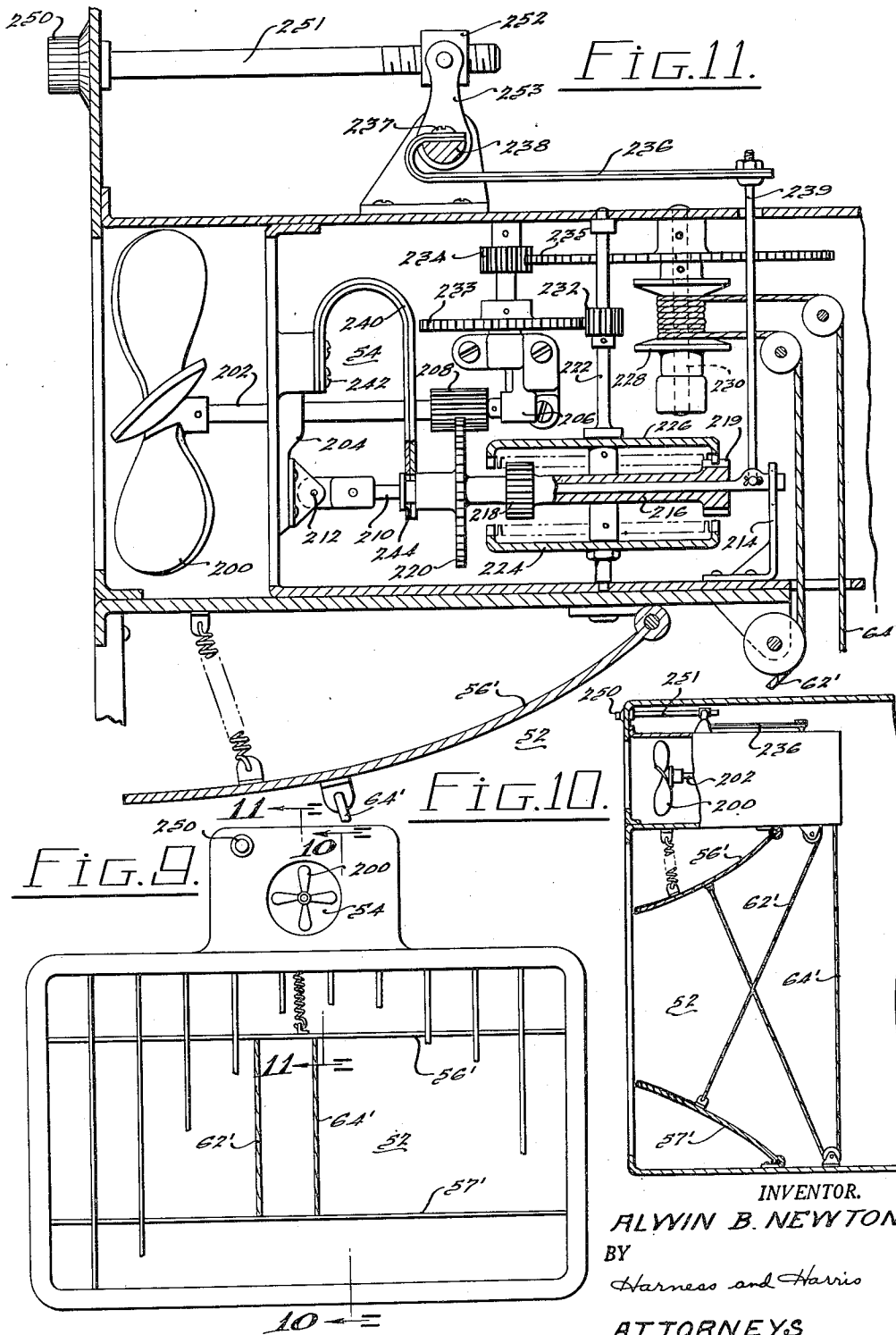
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3 Sheets-Sheet 3



UNITED STATES PATENT OFFICE

2,533,175

AIR CONTROLLING GRILLE

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Application January 3, 1947, Serial No. 720,081

15 Claims. (Cl. 236—1)

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This invention relates to air conditioning apparatus and more particularly to a temperature responsive means for controlling the admission of conditioned air to a room.

Air conditioning systems adapted to provide warm air for heating, or in the alternative, cool air for cooling, are well-known. Such systems commonly respond to the control of one thermostat provided for a plurality of air outlets. It is an object of my invention to provide each outlet with temperature responsive means to control the admission of air. A second means is provided to automatically control the first means so that its operative effect relative to the admission of air is reversed when cool air is supplied instead of warm air. Thus, if the first means is responsive to room temperature and adapted to automatically open and close grille members provided at the outlet, and if a second means responsive to the temperature of air being delivered by the outlet is adapted to reverse the first means the admission of air at a predetermined room temperature will be dependent upon the temperature of the incoming air. In the winter when warm air is being delivered to the room and a predetermined temperature is attained the first means will close the grille. In the summer when cool air is being delivered to the room and a similar temperature is attained the first means will open the grille. The temperature of the air delivered will cause the second means to reverse the operative effect of the first means with the seasonal changes.

Means are provided herein to use the motion of air being delivered by the system as the motive power for opening or closing grille members. This controls the admission of air to the room without requiring supplemental motive means for operating the grille members.

A further object of the invention is to provide a novel motive means having a driving element which is in substantially constant motion as long as air is being provided by the system. A novel clutch is combined with this driving element for selectively moving the grille members and controlling the direction of motion of the grille members.

An adjustment is provided so that the critical temperature at which the first means will be actuated is variable.

In the drawings:

Fig. 1 is a view in elevation of the front of a grille having the present invention applied thereto.

Fig. 2 is a sectional view taken substantially along line 2—2 of Fig. 1.

Fig. 3 is an enlarged side elevation of the grille operating mechanism at one stage of operation.

Fig. 4 is a similar view showing another stage of operation.

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Fig. 5 is a front partial elevation with parts cut away to illustrate the adjusting means.

Fig. 6 is a front elevation of a modified form of the invention.

Fig. 7 is a horizontal section on the line 7—7 of Fig. 6.

Fig. 8 is a vertical section taken substantially on the line 8—8 of Fig. 6.

Fig. 9 is a front elevation of another form of the invention.

Fig. 10 is a vertical section taken substantially on the line 10—10 of Fig. 9.

Fig. 11 is a vertical section taken substantially on the line 11—11 of Fig. 9.

Fig. 12 is an enlarged fragmentary view of the yieldable connection illustrated in Fig. 5.

The device is shown in Figs. 1 through 5 as applied to the end of an air supply duct 10 and comprising a perforated plate 11 which may be set flush with a room wall if desired. A movable grille or perforated plate 12 is held against the inner surface of plate 11 by springs 13 which permit vertical movement of the grille. Preferably the lower edges of the perforations in plate 11 and the upper edges of the perforations in grille 12 are provided with horizontal flanges 14 to impart the desired direction to the streams of air issuing from the perforations and to cause room air to flow in to mix with supply air from above and below. Other movable forms of grilles may be substituted for that shown.

The grille 12 is moved up or down by the rotation of a shaft 15. One means for effecting this movement is illustrated. The shaft 15 is threaded and passes through a threaded hole in the end of a bracket 16 mounted on the plate. Other driving means such as a gear train, a rotatable drum and wire may be substituted without departing from the invention. Rotation of the threaded shaft is effected by the rotation of either one of a pair of turntables 17 and 18 fixed to the upper end of the screw. The turntables are rotated by the engagement therewith of either one of a pair of drivers 19 and 20 fixed to a shaft 21 which has a reaction turbine 22 thereon. The turbine is held in an opening 23 in plate 11 and is rotated by air which moves therethrough as an incident to the pressure drop between duct 10 and the room. The grille 12 comprises a plurality of restricted orifices which inherently create such a pressure drop. Frictional engagement of driver 19 with turntable 17 as seen in Fig. 3 causes counter-clockwise rotation of threaded shaft 15 and closing of the grille openings, while engagement of driver 19 with turntable 18 causes reversal of this action.

In order to permit the alternate engagement of a driver with the turntables the shaft 21 is shiftably mounted as follows. The inner end of the shaft is pivotally mounted as by a ball 25

held in a socket 26. The outer end of shaft 21 is loosely journaled in a bearing 27 at the free end of a bimetallic bar 28 having one end fixed by a pivot pin 29 projecting from plate 11. The bar is provided with an extension 30 provided with a forked end 31 straddling an eccentric 32 mounted on plate 11 whereby the position of the bar may be adjusted, thus affecting the position of shaft 21. As the room air is caused to circulate about the bar 28 the bar is warped up or down by the effect of the ambient temperature of the room, thus causing the driver to engage the upper or lower turntable to regulate the supply of conditioned air. Preferably the eccentric 32 is provided with a graduated dial 33 to aid in making desired adjustments.

The operative connection between bar 28 and extension 30 is preferably yieldable so that the operation of the eccentric 32 can not impose sufficient pressure on the driver through its engagement with a turntable to stall the turbine 22 and shaft 21. A collar 34 is secured to extension 30. A pair of spaced fingers 35 are secured to bar 28 and straddle extension 30. A pin 36 is secured to the fingers 35 and penetrates an elongated slot 37 provided in extension 30. A spring 38 positioned concentrically of extension 30 and in operative engagement with collar 34 and fingers 35 urges pin 36 to the left in Fig. 12. When the pressure of the driver on the turntable exceeds a predetermined value the spring yields and the pin 36 tilts in the slot 37 and the bar 28 and extension 30 become disaligned thereby limiting the force that may be imparted to shaft 21 by operation of eccentric 32.

The pivot end of shaft 21 may be fixed in relative position for the device as so far described, but I prefer to make it automatically shiftable axially of the shaft in order to provide year-round control of the grille. For this reason shaft 21 is slidable axially of bearing 27 and the socket 26 is mounted on the free end of a horse-shoe-shaped bimetallic member 40 having its other end fixed to an immovable bracket 41. In the summer the supply of cooled air in duct 10 causes contraction of member 40 to move socket 26 forward to cause engagement of driver 19 as seen in Fig. 3, while the heated air supplied in winter expands member 40 to move socket 26 rearward to cause engagement of driver 20 as seen in Fig. 4. A stationary element 42 is provided with spaced lugs 43 and 44. The socket 26 is provided with a projection 45 located in the same plane as the lugs 43 and 44. Engagement of the projection 45 with lugs 43 and 44 limits movement of the shaft 21. Shaft 21 will always rotate in the same direction, but the drivers are located on opposite sides of the shaft 15 and the direction of rotation of shaft 15 will be dependent upon which driver is engaging a turntable and upon which turntable is being engaged. Bimetallic bar 28 selects the turntable and bimetallic member 40 selects the driver. Bar 28 is sensitive to room temperature and member 40 is sensitive to the temperature of air being delivered in the duct 10.

The member 40 may be positioned so that its change in shape in response to duct temperature change produces the effect described above of moving the shaft 21 to the right and left in Fig. 3 or it may produce an additional movement. When cold air is supplied in duct 10 the pivot 25 may be moved downward as well as forward. The downward movement raises the temperature required for movement of shaft 21 upward

under the influence of bimetallic bar 28. By properly shaping and positioning member 40 the amount of change in control point for summer operation can be pre-selected.

Operation.—Let us assume that a room is to be kept at 72° F. winter and summer. In summer member 40 contracts to cause driver 19 to be in position to engage either turntable. Bimetallic bar 28 when cool engages driver 17 with one turntable and when warm it causes driver 20 to engage the other turntable. There is thus provided a driving means for raising or lowering the grille 12. The turbine 22 rotates continuously and when the grille has reached the limit of its movement in one direction the member 13 slips relative to the associated turntable. The room temperature desired may be selected by operation of the dial 33. When winter comes and heated air is supplied member 40 expands and driver 20 is moved in engaging position.

Figs. 6, 7, and 8 illustrate a modified form of the device. An air supply duct 50 delivers air to the device. The device separates the discharge end of the duct 50 into two portions, namely the main air discharge passage 52 and an auxiliary passage 54 housing the control apparatus. A pair of shutters 56 and 57 are hinged in the main discharge passage 52. When these shutters are open a substantially unrestricted flow of air into the room is permitted. When these shutters are closed practically all movement of air through the main discharge passage is stopped although a negligible amount of air may enter the room through the auxiliary passage 54 in order to actuate the control apparatus.

The control apparatus comprises a rotatable turbine 58 positioned in the auxiliary passage 54 and a spool 60 adapted to be driven through gear means to be described and to selectively wind up and unwind a pair of wires 62 and 64. Wire 62 is secured to a mid portion of shutter 57. Wire 64 travels around a pulley member 66 and is secured to a mid portion of the shutter 56. When the spool 60 is rotated in one direction the wires 62 and 64 are wound around the spool to draw the shutter members towards their closed position. When the spool is rotated in the opposite direction the wire is unwound and gravity moves shutter 57 to its open position and shutter 56 is moved to its open position by a spring 68. The movement of air through the main discharge passage 52 supplements the effect of gravity and the spring 68 in opening the shutters. The turbine 58 is keyed to a rotatable shaft 70. Movement of air through the auxiliary passage 54 rotates the turbine and shaft 70. A second shaft 72 is rotatably mounted in a stationary bracket 74 and extends transversely of the passage 54. The shaft 72 carries a pair of spaced pinions 76 and 78 which are connected by a member 75 to form a unitary structure. Suitable gearing including a pinion 79, gear 80, pinion 81, gear 82, pinion 83 and gear 84 serves as a motion transmitting connection between the turbine shaft 70 and the second shaft 72 so that the shaft 72 is rotated in response to rotation of the turbine 58. Stub shafts 85 and 86 may be provided to support portions of the intermediate gearing referred to above. A shaft 87 is rotatably mounted in the housing forming passage 54 and in a stationary bracket 88. The shaft 87 extends transversely of the shaft 72. The spool 60 previously referred to is pinned to the shaft 87 to rotate therewith. A pair of similar face gears 90 and 91 are slidably keyed on the shaft 87 and have a

diameter slightly less than the distance between the pinions 76 and 78 so that relative movements between the pinions 76 and 78 and the face gears 90 and 91 may cause one of the face gears to be driven by one of the pinions. The pinions 76 and 78 are similar in operation to the drivers 19 and 20 discussed in the first form of the invention. The face gears 90 and 91 are similar in operation to the turntables 17 and 18 disclosed in the first form of the invention.

Temperature responsive control means are provided to move the pinions 76 and 78 axially of the shaft 72 in response to changes in room temperature and to move the face gears 90 and 91 transversely of the shaft 72 in response to changes in temperature of the air being supplied by the duct 50. The face gears 90 and 91 are each secured to a collar 92 which is splined on the shaft 87. A temperature responsive bimetallic element 94 is secured at one end to the housing forming the passage 54 at 95. The opposite end of the bimetallic element 94 is received in an annular groove 96 provided in collar 92. Deformation of the bimetallic element 94 which will occur in response to changes in the temperature of the air being delivered through the passage 54 will move the face gears 90 and 91 axially on the shaft 87 so that either one or the other will be in the proper position to engage one of the pinions 76 or 78. A bimetallic element 98 has one end secured at 100 to a stationary object and is exposed to room temperature. Deformation of bimetallic element 98 as a result of changes in room temperature will through a link 102 and bell crank 104 slide the member 75 and pinions 76 and 78 axially of the shaft 72. The link 102 is secured to one end of the bimetallic element 98 and to one end of the bell crank 104. The outer end of the bell crank 104 is received in an annular slot 103 provided in the member in the operation of this form of the invention with the parts in the positions illustrated in Fig. 7. The rotation of the turbine 58 induced by the movement of air through the passage 54 will rotate shaft 70 and through gearing rotate shaft 72 and pinion 78. Pinion 78 will rotate face gear 90, shaft 87 and spool 60 to control to wires 62 and 64 connected to the shutters 56 and 57. When the room temperature has changed sufficiently to cause the bimetallic member 98 to move downward the member 75 will be shifted to the right in Fig. 7 and pinion 76 will be in engagement with the facegear 91. The drive from the fan 53 to the face gear 90 will then be through the pinion 76 instead of pinion 78 and the direction of rotation of the face gear 90 and spool 60 will be reversed. This will move the shutters 56 and 57 in the reverse direction to control the admission of air to the room from the duct 50. In the summer when cool air is supplied by the duct 50 instead of warm air the bimetallic element 94 will be deformed downwardly in Fig. 7 thereby shifting the face gear 91 into position for engagement by the pinions 76 or 78. This change from one face gear to the other will reverse the driving effect of each pinion, as, for example, the pinion 78 in driving the face gear 90 causes the shutters 56 and 57 to open and will when driving the face gear 91 cause the shutters to close. The relationship between the room temperature and the opening of the shutter is thus reversed by the bimetallic element 94. A calibrated control knob 106 may be provided for manual control of the bimetallic member 98 so that the temperatures at which a movement of the pinions 76 and 78

will be caused may be varied to suit individual requirements.

A second modified form of the invention is illustrated in Figs. 9, 10 and 11. This form is substantially the same as the form illustrated in Figs. 6, 7 and 8 except that the driving mechanism has been altered and the room temperature sensitive thermostat moves the drive pinion alternately to engage one or the other of a pair of face gears while the air supply temperature sensitive thermostat shifts the driving pinions axially instead of shifting the face gears. In this form of the invention a main air supply passage 52 and an auxiliary air passage 54 are provided. Shutters 56' and 57' are provided and operated by wires 62' and 64'. A turbine 200 is pinned to a shaft 202 and adapted to be rotated by the movement of air through the passage 54. The shaft 202 is rotatably mounted in brackets 204 and 206. An elongated pinion 208 is pinned to the shaft 202. A second shaft 210 is provided in parallel relationship with the shaft 202 and has one end pivotally mounted in 212 on the bracket 204. The opposite end of the shaft 210 is retained for lateral stability in a slot (not shown) in a stationary bracket 214. The shaft 210 may thus rotate in a vertical plane only about the shaft 212. Member 216 is slidably splined on the shaft 210 and has a pair of spaced pinions 218 and 219 formed thereon and a gear 220 adapted to engage the elongated pinion 208 is formed thereon. Rotation of the turbine 200 is thus transmitted through the pinion 208 and gear 220 to cause rotation of the driving pinions 218 and 219. A vertical shaft 222 is rotatably mounted and has secured thereto a pair of spaced face gears 224 and 226. A spool 228 is rotatably mounted on a stub shaft 230. Rotation of the face gears 224 or 226 is transmitted to the spool 228 through suitable gearing including a pinion 232 pinned to shaft 222, a gear 233, a pinion 234 and a gear 235 pinned to stub shaft 230.

A pair of thermostats are provided as in the previous forms of the invention to control the relative positions of the face gears 224 and 226 and the pinions 218 and 219. A room temperature responsive bimetallic element 236 has one end secured at 237 to a relatively stationary shaft 238. The other end of the bimetallic element 236 is connected by a link 239 to the free end of shaft 210 adjacent the bracket 214. Deformation of the bimetallic element 236 in response to changes in room temperature will thus rotate the shaft 210 about the pivot 212 and selectively engage a driving pinion with one or the other of the face gears 224 or 226. A second bimetallic element 240 is secured at 242 to the bracket 204 and has its free end received in an annular slot 244 provided in the member 216. Deformation of the bimetallic element 240 will move the member 216 and pinions 218 and 219 axially on the shaft 210 to engage one or the other of the driving pinions with a face gear.

In a manner similar to that described in the previous form of the invention the constant rotation of the turbine 200 is used to open and close the shutters. By means of bimetallic element 236 the direction of motion is controlled by room temperature. By means of bimetallic element 240 the effect of room temperature on the movement of the shutters is reversed when cool air is supplied by the duct 50 instead of warm air. A manually operable calibrated knob 250 is provided on the end of a threaded shaft 251. A nut 252 is pivotally mounted on a lever 253 connected

to the shaft 238. Rotation of the calibrated knob 250 thus induces a change in position of the bimetallic element 236. There is thus provided a manual control so that the apparatus may be made responsive to a desired room temperature.

It is to be appreciated that in order to illustrate the device clearly I have exaggerated certain parts which in actual practice would be relatively thinner or lighter in construction, and various details may be otherwise altered as desired by those skilled in the art. All such modifications in detail and arrangement as come within the scope of the following claims are considered a part of my invention.

I claim:

1. An apparatus for controlling the admission of air to a room comprising a member having an air passage therein associated with a source of supply, a first means to restrict said passage, a second means substantially constantly driven by air supplied to said passage, an operative connection between said second means and said first means through which said first means is driven, said operative connection including a releasable clutch device adapted to interrupt said operative connection when released, temperature responsive means to selectively engage and release said clutch device in response to changes in room temperature and temperature responsive reversing means adapted to reverse the drive of said first means by said second means in response to predetermined changes in the temperature of the air in said passage.

2. An apparatus for controlling the admission of air to a room comprising a member having an air passage therein associated with a source of supply, a first means to restrict said passage, a second means substantially constantly driven by air supplied to said passage, a first driven member, a second driven member, a third means to transmit drive from either of said members to said first means, a fourth means to operatively associate said second means with said first member under a first set of temperature conditions and to operatively associate said second means with said second member under a second set of temperature conditions, said second means being adapted to drive said first member in one direction when associated therewith and to drive said second member in an opposite direction when associated with the second member whereby the movement of said first means is reversed for different sets of temperature conditions.

3. An apparatus for controlling the admission of air to a room comprising a member having an air passage therein associated with a source of supply, a first means to restrict said passage, a second means substantially constantly driven by air supplied to said passage, a first driven member, a second driven member, a third means to transmit drive from either of said members to said first means, a fourth means to operatively associate said second means with said first member under a first set of temperature conditions and to operatively associate said second means with said second member under a second set of temperature conditions, said second means being adapted to drive said first member in one direction when associated therewith and to drive said second member in an opposite direction when associated with the second member whereby the movement of said first means is reversed for different sets of temperature conditions and a fifth means responsive to predetermined temperature conditions of the air in said passage and

operative to reverse the drive of said second means on said members so that under said first set of temperature conditions said second means is driving one of said members in a first direction and under said second set of temperature conditions said second means is driving said member in a second direction when the air in said passage fulfills the predetermined temperature conditions.

4. An apparatus for controlling the admission of air to a room comprising a member having an air passage therein associated with a source of supply, a first movable means to restrict said passage, a turbine driven by air supplied to said passage and adapted to move said first means, a pair of rotatable spaced driving members, a pair of rotatable spaced driven members, said driving members and said driven members being relatively shiftable in a first and second direction, thermostatic means to selectively shift said members in said first and second directions and engage one of said driving members with one of said driven members, said thermostatic means comprising a first bimetal element exposed to room temperature and adapted to shift said members in said first direction and a second bimetal element exposed to air in said passage and adapted to shift said members in said second direction.

5. An apparatus for controlling the admission of air to a room comprising a member having an air passage therein associated with a source of supply, a first movable means to restrict said passage, a turbine driven by air supplied to said passage, a first pair of spaced coaxial gears operatively connected to said first means, a second pair of spaced coaxial gears operatively connected to said turbine and adapted to be rotated thereby, a first thermostatic element exposed to room temperature, means operatively connecting said thermostatic element to said second pair of gears and adapted to position one of said second pair of gears for engagement with one of said first pair of gears under a first set of room temperature conditions and to position the other of said second pair of gears for engagement with one of said first pair of gears under a second set of room temperature conditions, and a second thermostatic element exposed to air in said passage and adapted to position one or the other of said first pair of gears for said engagement depending upon the temperature of the air in said passage whereby the position of said first means is dependent upon the temperature of the air in said passage and the temperature of the air in said room.

6. An apparatus for controlling the admission of air to a room comprising a member having an air passage therein associated with a source of supply, a first movable means to restrict said passage, a turbine driven by air supplied to said passage, a first pair of spaced coaxial gears operatively connected to said first means, a second pair of spaced coaxial gears operatively connected to said turbine and adapted to be rotated thereby, a first thermostatic element exposed to the air in said passage, means operatively connecting said thermostatic element to said second pair of gears and adapted to select one of said second pair of gears for engagement with one of said first pair of gears under a first set of air supply temperature conditions and to select the other of said second pair of gears for engagement with one of said first pair of gears under a second set of air supply temperature conditions, and a second thermostatic element

exposed to room temperature and adapted to select one of said first pair of gears for engagement with one of said second pair of gears depending upon the temperature of the room whereby the position of said first means is dependent upon the temperature of the air in said passage and the temperature of the air in said room.

7. In an apparatus for controlling the discharge of air from an air supply passage to a room, means dividing the outlet for said passage into first and second air discharge openings, damper means operable to restrict in varying degree the discharge of air through said first opening from a source of supply of air, means deriving energy from the movement of air supplied to said second opening to move said damper means comprising a turbine adapted to be rotated by the force of the air supplied to said second opening, a shaft carrying said turbine, means for translating rotation of said shaft to movement of said damper means, said last mentioned means comprising first and second driving elements carried by said shaft, a pair of spaced turntables associated with said damper means and between which said driving elements may be selectively located, the spacing of said turntables being such that the selected driving element may only engage one of said turntables at a time, means for shifting the relative position of said shaft and said turntables automatically upon change of supply from heated to cooled air or vice versa to move one of the other of said driving elements into a position between said turntables, means so mounting said shaft as to permit alternate engagement of the driving element located between said turntables with one or the other of said turntables, said last means comprising a journal supporting one end of said shaft, a bimetallic element carrying said journal and exposed to space to which air is being supplied to shift the position of said journal automatically in response to predetermined temperature conditions in the space to which air is being supplied, and means for adjusting the position of said bimetallic element so as to vary the temperature conditions to which said bimetallic element will respond.

8. In an apparatus for controlling the discharge of air from an air supply passage to a room, means dividing the outlet for said passage into first and second air discharge openings, damper means operable to restrict in varying degree the discharge of air through said first opening from a source of supply of air, means deriving energy from the movement of air supplied to said second opening to move said damper means comprising a turbine adapted to be rotated by the force of the air supplied to said second opening, a shaft carrying said turbine, means for translating rotation of said shaft to movement of said damper means, said last mentioned means comprising first and second driving elements carried by said shaft, a pair of spaced turntables associated with said damper means and between which said driving elements may be selectively located, the spacing of said turntables being such that the selected driving element may only engage one of said turntables at a time, means for shifting the relative position of said shaft and said turntables automatically upon change of supply from heated to cooled air or vice versa to move one or the other of said driving elements into position to engage said turntables on opposite sides of the turntable axis whereby the same movement of said

bimetallic element causes movement of said damper means in opposite directions depending on which of said driving elements is in engagement, means so mounting said shaft as to permit alternate engagement of the driving element located between said turntables with one or the other of said turntables, said last means comprising a journal supporting one end of said shaft, a bimetallic element carrying said journal and exposed to space to which air is being supplied to shift the position of said journal automatically in response to predetermined temperature conditions in the space to which air is being supplied, and means for adjusting the position of said bimetallic element so as to vary the temperature conditions to which said bimetallic element will respond.

9. In an apparatus for controlling the discharge of air from an air supply passage to a room, means dividing the outlet for said passage into first and second air discharge openings, damper means operable to restrict in varying degree the discharge of air through said first opening from a source of supply of air, means deriving energy from the movement of air supplied to said second opening to move said damper means comprising a turbine adapted to be rotated by the force of the air supplied to said second opening, a shaft carrying said turbine, means for translating rotation of said shaft to movement of said damper means, said last mentioned means comprising first and second driving elements carried by said shaft, a pair of spaced turntables associated with said damper means and between which said driving elements may be selectively located, the spacing of said turntables being such that the selected driving element may only engage one of said turntables at a time, means for shifting the relative position of said shaft and said turntables automatically upon change of supply from heated to cooled air or vice versa to move one or the other of said driving elements into position to engage said turntables on opposite sides of the turntable axis, said last means comprising a bimetallic element supporting one end of said shaft and exposed to the air supplied to said grille, means so mounting said shaft as to permit alternate engagement of the driving element located between said turntables with one or the other of said turntables, said last means comprising a journal supporting the other end of said shaft, a bimetallic element carrying said journal and exposed to space to which air is being supplied to shift the position of said journal automatically in response to predetermined temperature conditions in the space to which air is being supplied, and means for adjusting the position of said bimetallic element so as to vary the temperature conditions to which said bimetallic element will respond.

10. In an apparatus for controlling the discharge of air from an air supply passage to a room, means dividing the outlet for said passage into first and second air discharge openings, damper means operable to restrict in varying degree the discharge of air from said first opening, an air driven turbine mechanism deriving energy from the air discharged from said second opening and operable to utilize said energy to locate said damper means, room temperature responsive control means operable to selectively drivingly connect and disconnect said turbine and said damper means, and air passage temperature responsive control means operable to

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reverse the driving relation between said turbine and said damper means in response to predetermined temperature changes of the air in said passage.

11. An apparatus for controlling the discharge of air from an air supply passage to a room, means dividing the outlet for said passage into first and second discharge openings, damper means operable to restrict said first opening, a driving means utilizing the static pressure difference between said passage and said room to actuate said damper means, said driving means comprising a reaction turbine adapted to be rotated by air discharged through said second opening from said passage and clutch means operable to selectively drivingly connect and disconnect said turbine and said damper.

12. An apparatus for controlling the admission of air to a room comprising a member having an air passage therein associated with a source of supply, a first means to restrict said passage and the discharge of air therefrom, a reaction turbine deriving energy from the pressure drop across said first means and a second means selectively operably connecting and disconnecting said turbine with said first means in response to temperature changes.

13. In an apparatus for controlling the discharge of air from an air supply passage to a room, means dividing the outlet for said passage into first and second air discharge openings, damper means to restrict said first opening, an air driven reaction turbine deriving energy from the pressure drop across said damper, an operative connection between said turbine and said damper means through which said damper means is driven, said operative connection including a releasable clutch device adapted to interrupt said operative connection when released and temperature responsive means to selectively engage and release said clutch device in response to changes in room temperature.

14. In an apparatus for controlling the discharge of air from an air supply passage to a room, means dividing the outlet for said passage into first and second air discharge openings, damper means operable to restrict in varying degree the discharge of air through said first opening, means deriving energy from the movement of air supplied to said second opening to move said damper means comprising a turbine adapted to be rotated by the force of air supplied to said second opening, a shaft carrying said turbine, means for translating rotation of said shaft to movement of said damper means, said last-mentioned means comprising a driving wheel carried

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by said shaft, a pair of spaced turntables associated with said damper means and between which said wheel is located, the spacing of said turntables being such that said wheel may only engage one of said turntables at a time, means so mounting said shaft as to permit alternate engagement of said driving wheel with one or the other of said turntables, said last means comprising a journal supporting one end of said shaft, a bimetallic element carrying said journal and exposed to space to which air is being supplied to shift the position of said journal automatically in response to predetermined temperature conditions in the space to which air is being supplied, and means for adjusting the position of said bimetallic element so as to vary the temperature conditions to which said bimetallic element will respond.

15. In an apparatus for controlling the discharge of air from an air supply passage to a room, means dividing the outlet for said passage into first and second air discharge openings, damper means operable to restrict in varying degree the discharge of air through said first opening, a second means deriving energy from the movement of air supplied to said second opening to move said damper means and comprising a reaction turbine adapted to derive energy for rotation from the pressure drop created by said damper means, drive transmitting means associated with said turbine and said damper means and adapted to move said damper means in response to rotation of said turbine, said drive transmitting means comprising a pair of rotatable elements in engagement with each other and positioned in planes at right angles to each other, one of said elements being operatively connected to said turbine and the other of said elements being operatively connected to said damper means.

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