Jan. 21, 1930. R. T. WILLIAMS 1,744,189

DAMPER CONTROL

Filed Feb. 21, 1929 2 Sheets-Sheet 1

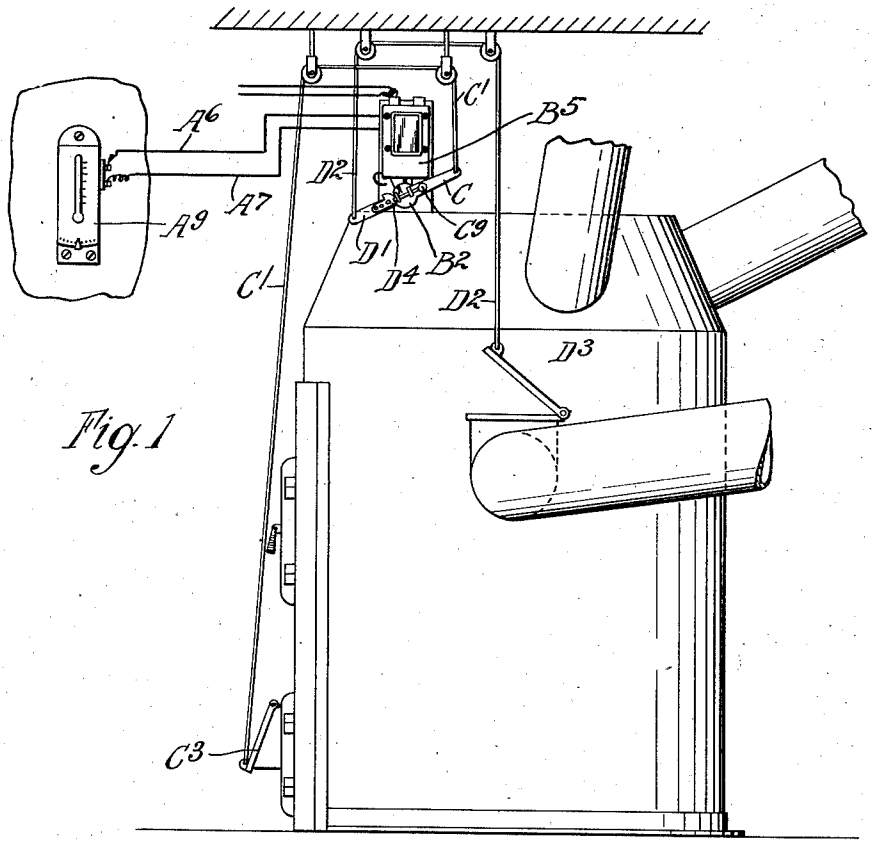


Fig. 1

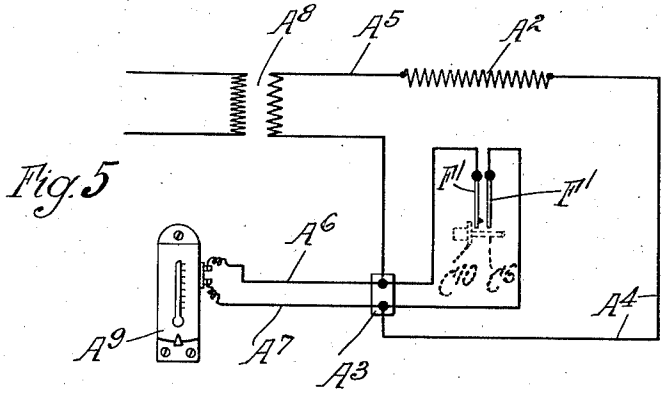


Fig. 5

Inventor
Robert T. Williams
by Parker & Carter
Attorneys.

Jan. 21, 1930. R. T. WILLIAMS 1,744,189

DAMPER CONTROL

Filed Feb. 21, 1929 2 Sheets-Sheet 2

Fig. 2

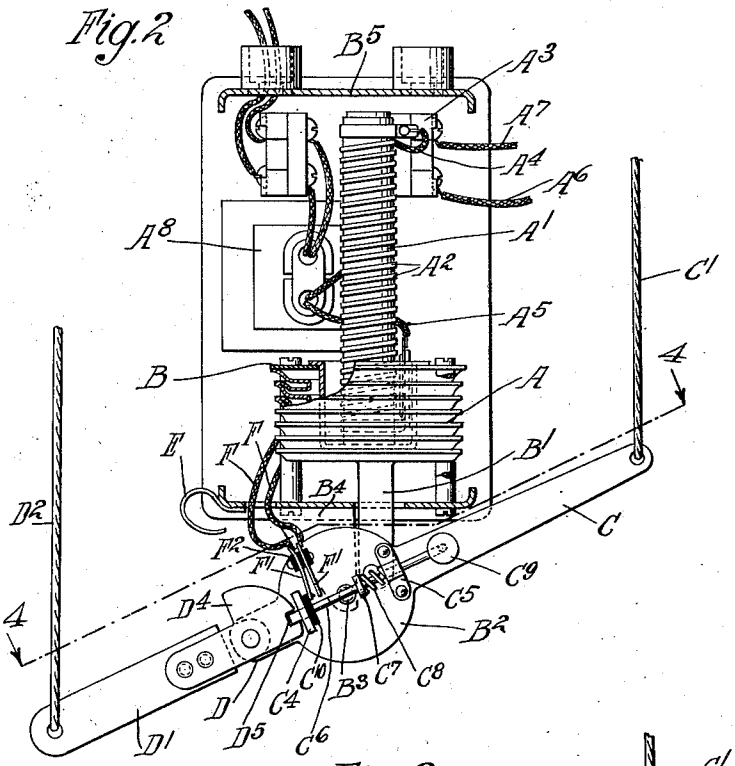


Fig. 3

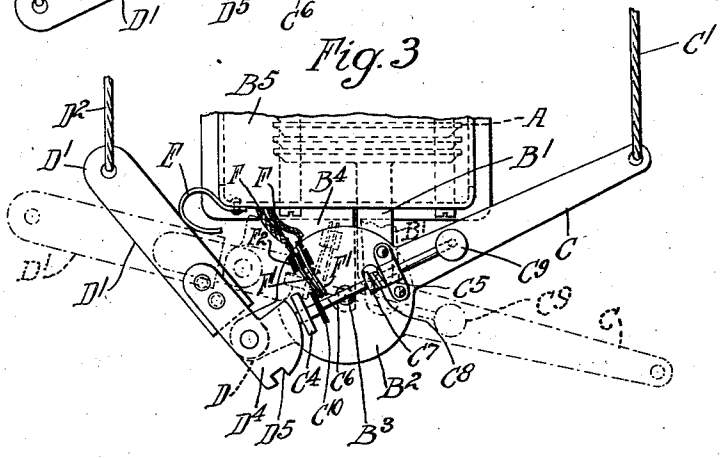
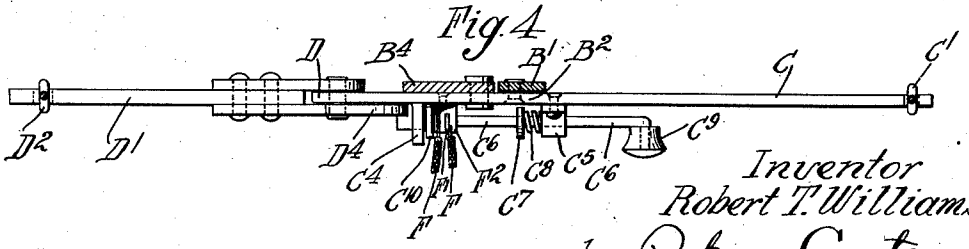


Fig. 4



Inventor
Robert T. Williams
by Parker & Carter.
Attorneys.

Patented Jan. 21, 1930

1,744,189

UNITED STATES PATENT OFFICE

ROBERT T. WILLIAMS, OF QUINCY, ILLINOIS, ASSIGNOR TO H. M. SHEER COMPANY, OF QUINCY, ILLINOIS, A CORPORATION OF ILLINOIS

DAMPER CONTROL

Application filed February 21, 1929. Serial No. 341,604.

This invention relates to damper controls for house heating systems in which an automatic control is provided which may operate thermostatically or otherwise. One of the objects of the invention is to provide in connection with such a damper control means whereby the dampers may be operated manually, as for example, when coaling is to take place and in which the control will automatically return to normal, automatic operation after a predetermined interval. Another object is to provide such a control permitting temporary manual operation at a point distant from the thermostatic control. Other objects will appear from time to time in the course of the specification and claims.

The invention is illustrated more or less diagrammatically in the accompanying drawings wherein:

Figure 1 is an elevation of a furnace with my invention applied;

Figure 2 is a front elevation of the device in normal working position with parts broken away and parts in section;

Figure 3 is a fragmentary view based on Figure 2 showing the parts in manipulated position;

Figure 4 is a sectional view taken on line 4—4 of Figure 2;

Figure 5 is a wiring diagram.

Like parts are indicated by like symbols throughout the specification and drawings.

A is a closed bellows which may contain gas. A^1 is a reservoir communicating with the bellows. A^2 is an electric heating coil preferably formed about the reservoir. A^3 is a junction box. A^4, A^5 are wires leading from the ends of the coil to the junction box A^3. The wire A^5 may be energized by means of a transformer A^8. A^6, A^7 are wires leading from the junction box to a thermostat A^9 which may be located at any suitable place and will usually be located in some part of the house remote from the heating escape and from the bellows.

B is a frame upon which the bellows is anchored at one end. B^1 is a connecting rod carried by and preferably fastened to the other end of the bellows. B^2 is a crank plate pivoted on an axle B^3. The connecting rod B^1 is pivotally attached to the crank plate B^2. The axle B^3 is supported on a bracket B^4 which projects downwardly from a housing B^5 which incloses the bellows and associated parts.

Extending from the crank plate B^2 and preferably formed integrally with it is an arm C. To this arm is attached a cable rope or other connection C^1 which passes over suitable pulleys and is finally attached to a damper door C^3. C^4, C^5 are guiding and retaining members fixed on the crank plate B^2. Slidably mounted within these guides is a locking pin C^6. C^7 is a member fixed on the pin C^6. C^8 is a compression spring about the pin C^6 bearing at one end against the member C^7 and at its other end against the guide C^5. C^9 is a handle on the pin C^6. C^{10} is a contacting member mounted on the pin C^6 and formed preferably of insulating material or insulated from the pin C^6.

D is an extension from the crank plate B^2 and preferably integral with it. Pivoted on this extension is a handle D^1 which is connected to a cable wire or other similar means D^2 which, through suitable pulleys, is attached to a damper D^3. Fastened to the handle D^1 and adapted to move with it is a quadrant D^4 provided with a notch D^5.

E is a spring positioned preferably on the housing, B^5, and adapted to be contacted by the arm D^1 when it is in the raised position, the spring serving to cushion the upward movement in case the latter is violent or rapid.

F, F are conductors which lead from the junction box and terminate in flexible contact members F^1, F^1. These members are supported in insulating supports F^2. Ordinarily, when free to move, they separate and so break contact, as shown in Figure 2. They can, however, be drawn together by movement of the pin C^6, as shown in Figure 3.

It is important to notice that the re-engaging mechanism is such and its operation is such that it permits the arms, that is to say, the members C and D^1 to re-engage or to assume the straight line position as shown in Figures 1 and 2 without being influenced by the weight or pressure or pull on the arms

themselves. The design and relationship of the parts is such as to eliminate any difficulty in this re-engaging operation due to pull or weight upon the arms.

Where in the claims I have referred to the fact that the lever arms and their weight do not affect or interfere with the re-engagement of the parts in their straight line position as shown in Figures 1 and 2, I wish this language also to include the fact that the operation is not only not interfered with or influenced by the weight of the lever parts, but by a pull exerted upon them or through them. Thus the re-engaging operation is not only not influenced by the weight of the parts C and D^1, but it is not influenced by a pull exerted upon them through the members C^1 or D^2.

It will be realized that while I have shown and described an operative structure, many changes may be made in the size, shape, relation, proportion and distribution of parts without departing from the spirit of my invention, and I wish, therefore, that my description and showing be considered as in a large measure diagrammatic.

The use and operation of this invention are as follows:

Under normal circumstances, when the operation is to be fully automatic, the parts are left in the position shown in Figures 1 and 2. When the operator wishes to fire the furnace, if he discovers that the check door or any of the other controlling doors are open, he moves the pin C^6 to the right, as shown in Figure 2, into the position which it occupies in Figure 3. This disengages the end of the pin from the slot D^5 and the weight of the check door will pull the handle D^1 into the upward position, permitting the door to close. As shown in Figure 1, it is the door D^3 which is open and as soon as the handle D^1 is free to move, the door D^3 of its own weight, through the cable D^2 will raise this handle into the position shown in full lines in Figure 3. When the pin C^6 is moved to the right into the position which it occupies in Figure 3, the contacts F^1, F^1 are engaged and the circuit to the resistance of the bellows is thus closed. These contacts are kept together as long as the pin is held in the position shown in Figure 3, that is to say, until it again drops into the notch D^5.

Under the influence of the heating which results from the actuation of the heating coil in response to the contact of the members F^1, F^1, the bellows expand, thus forcing the arm C downward until it again brings the pin C^6 into engagement with the notch D^5. This restores the arms to their original relative position, as shown in Figures 1 and 2 and breaks the contacts F^1, F^1, permitting the bellows to contract as the resistance element is cooled and again carrying the arm D^1, C, to the position which it occupied before the operator moved the handle C^9 to disengage the pin from the notch D^5 and to permit the movement just described.

I claim:

1. In combination with an automatic damper control, a controlling lever mounted for movement, the lever including a plurality of arms, each adapted to be attached to a separate control member, the lever being adapted to move as a unit and provided with means whereby its parts may be freed during use for relative movement.

2. In combination in an automatic damper control, a controlling lever mounted for movement, the lever including a plurality of arms, each adapted to be attached to a separate control member, the lever being adapted to move as a unit and provided with means whereby its parts may be freed for relative movement, and automatic means for again moving the lever into its unit position.

3. In combination with an automatic damper control, a controlling lever mounted for movement, the lever including a plurality of arms, each adapted to be attached to a separate control member, the lever being adapted to move as a unit and provided with manually controlled means whereby its parts may be freed during use for relative movement.

4. In combination in an automatic damper control, a controlling lever mounted for movement, the lever including a pair of arms, each adapted to be attached to a separate damper, the lever being adapted to move as a unit and provided with manually controlled means whereby its parts may be freed for relative movement, and automatic means for again moving the lever into its unit position.

5. In combination with an automatic damper control, a controlling lever mounted for automatic movement, means for operating it automatically, the lever including a plurality of arms, each adapted to be attached to a separate control member, the lever being adapted to move as a unit and provided with means whereby its parts may be freed during use for relative movement.

6. In combination in an automatic damper control, a controlling lever mounted for automatic movement, means for operating it automatically, the lever including a plurality of arms, each adapted to be attached to a separate control member, the lever being adapted to move as a unit and provided with means whereby its parts may be freed for relative movement and automatic means for again moving the lever to its unit position.

7. In combination in a damper control, a controlling lever mounted for movement, the lever including a pair of arms, each adapted to be attached to a separate damper, the lever being adapted to move as a unit and provided with means whereby its arms may be freed for relative movement, and automatic

means for again moving the lever into its unit position.

8. In combination in a damper control, a controlling lever mounted for automatic movement, means for operating it automatically, the lever including a pair of arms, each adapted to be attached to a separate damper, the lever being adapted to move as a unit and provided with means whereby its arms may be freed for relative movement, and said automatic operating means adapted to move the lever into its unit position.

9. A damper control lever in combination in a damper controlling assembly, the lever including two arms mounted for relative movement, means for holding them against relative movement and means for permitting their relative movement, in combination with means adapted to move the lever into the unit position when free to do so.

10. A damper control lever in combination in an electrically actuated damper controlling assembly, the lever including two arms mounted for relative movement, means for holding them against relative movement and means for permitting their relative movement, in combination with means adapted to move the lever into the unit position when free to do so.

11. A damper control lever in combination in an electrically actuated damper controlling assembly, the lever including two arms mounted for relative movement, means for holding them against relative movement and means for permitting their relative movement, in combination with electrical means adapted to move the lever into the unit position when free to do so.

12. A damper control lever in combination in an automatic electrically actuated damper controlling assembly, the lever including two arms mounted for relative movement, means for holding them against relative movement, and manually controlled means for permitting their relative movement, in combination with electrical means adapted to be put into operation by said manual control and adapted to move the lever into the unit position when free to do so.

13. In combination in a damper controlling system, an electrically operated automatic damper controlling assembly, a lever including two arms, one pivoted, means for normally holding them to move as a unit, means for freeing them, for relative movement, said automatic damper controlling assembly including automatic electrical means for restoring them to unit position.

14. In combination in a damper controlling system, an electrically operated automatic damper controlling assembly, a lever including two arms, one pivoted upon the other, means for normally holding them to move as a unit, means for freeing them, for relative movement, said automatic damper controlling assembly including automatic electrical means for restoring them to unit position.

15. In combination in a damper controlling system, an electrically operated automatic damper controlling assembly, a lever including two arms, one pivoted, means for normally holding them to move as a unit, manually controlled means for freeing them, for relative movement, said automatic damper controlling assembly including automatic electrical means for restoring them to unit position.

16. In combination in a damper controlling system, an electrically operated automatic damper controlling assembly, a lever including two arms, one pivoted with relation to the other, means for normally holding them to move as a unit, manually controlled means for freeing them, for relative movement, said automatic damper controlling assembly including automatic electrical means effective upon the operation of such manual means for restoring them to unit position.

17. In combination in a damper controlling system, an electrically operated automatic damper controlling assembly, a lever including two arms, one pivoted upon the other, means for normally holding them to move as a unit, manually controlled means for freeing them for relative movement, said automatic damper controlling assembly including automatic electrical means effective upon the operation of such manual means for restoring them to unit position.

18. In combination in an automatic damper control, control operating means and a damper lever formed of a main part adapted to be moved for control by said operating means, and provided with a relatively movable part pivoted thereon, means for locking said part against relative movement and means for freeing said part for relative movement to permit movement of one of the dampers independent of the control as a whole, responsive to the movement of such member whereby said main part is moved to reengage the relatively movable member to lock it in position against further relative movement.

19. In combination with an automatic damper control, a controlling lever mounted for movement, the lever including a plurality of arms, each adapted to be attached to a separate control member, the lever being adapted to move as a unit and provided with means whereby its parts may be freed for relative movement, said automatic damper controlling assembly including automatic means for again moving the lever into its unit position, such means being unaffected by the weight of the lever parts.

20. In combination with an automatic damper control, a controlling lever mounted for movement, the lever including a pair of arms, each adapted to be attached to a

separate damper, the lever being adapted to move as a unit and provided with manually controlled means whereby its parts may be freed for relative movement, said automatic damper controlling assembly including automatic means for again moving the lever into its unit position, such means being unaffected by the weight of the lever parts.

Signed at Quincy, county of Adams, and State of Illinois, this fourth day of February, 1929.

ROBERT T. WILLIAMS.