No. 607,900. Patented July 26, 1898.

C. F. WOOD.

AUTOMATIC DAMPER REGULATOR.

(Application filed Mar. 5, 1896. Renewed June 9, 1898.)

(No Model.) 2 Sheets—Sheet 1.

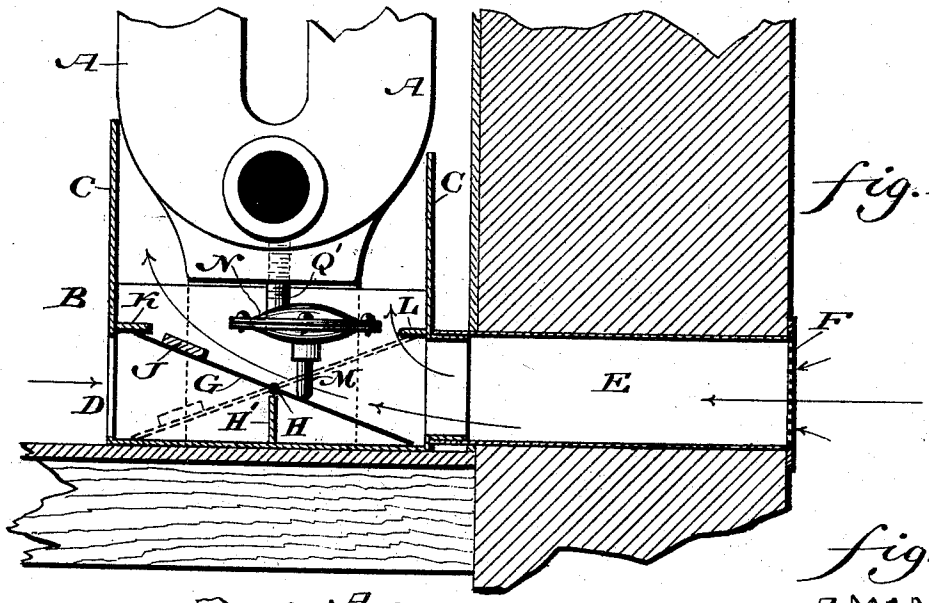

fig. 1.

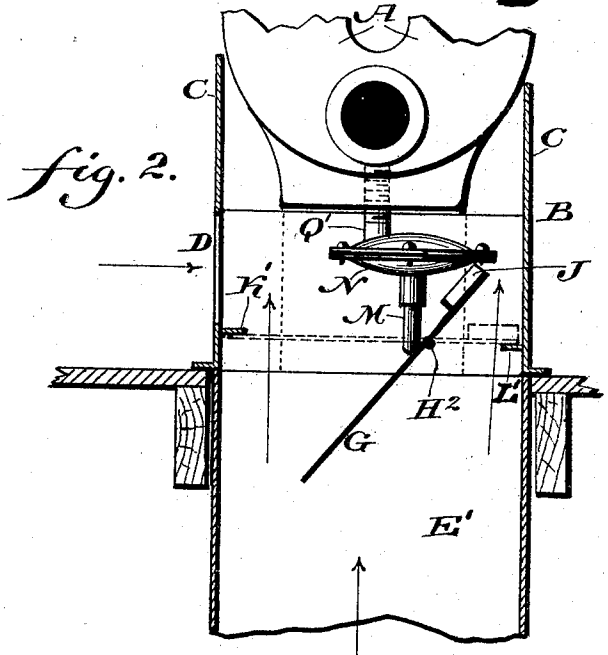

fig. 2.

fig. 3.

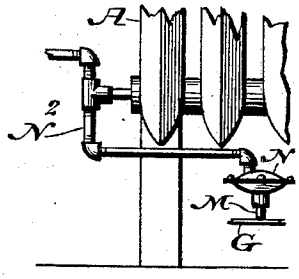

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fig. 4.

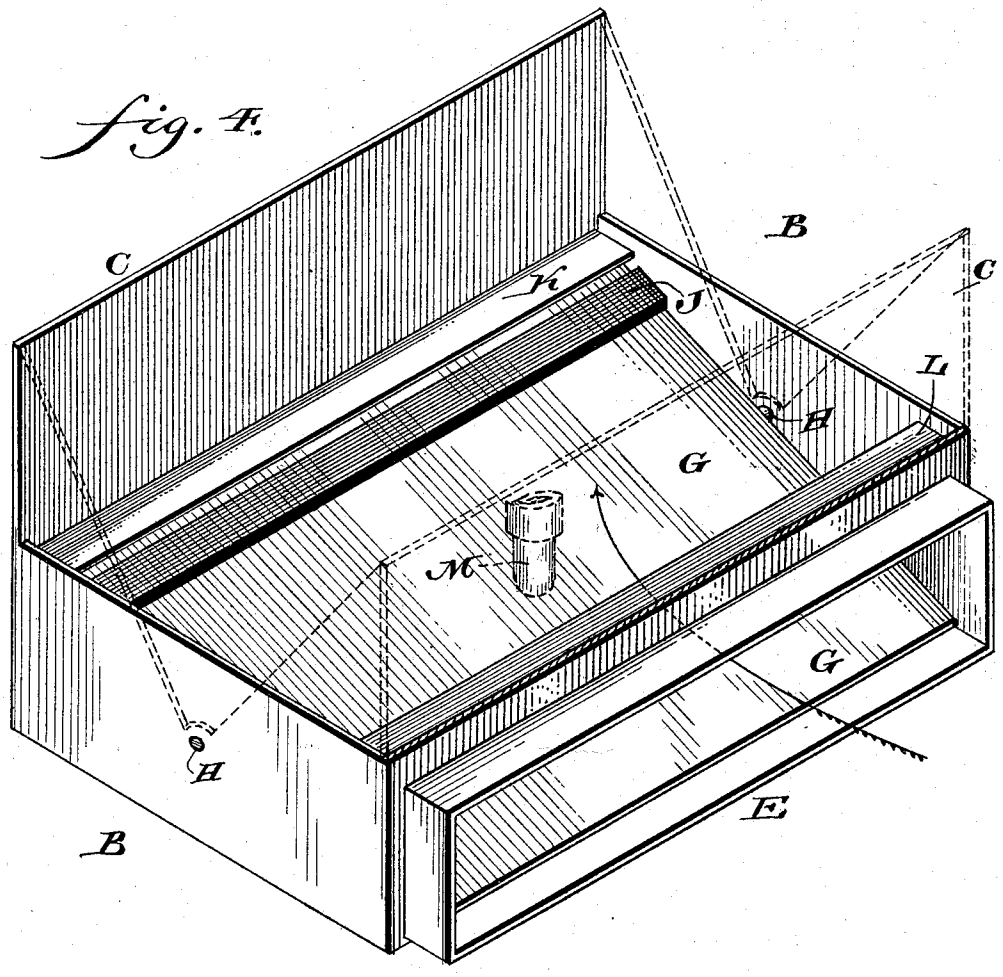
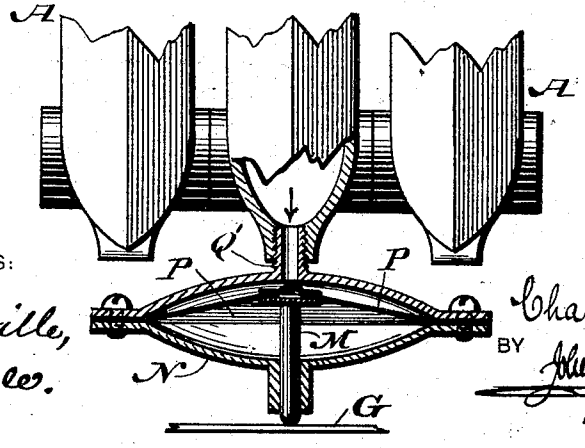


fig. 5.



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UNITED STATES PATENT OFFICE.

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AUTOMATIC DAMPER-REGULATOR.

SPECIFICATION forming part of Letters Patent No. 607,900, dated July 26, 1898.

Application filed March 5, 1896. Renewed June 9, 1898. Serial No. 683,037. (No model.)

To all whom it may concern:

Be it known that I, CHARLES F. WOOD, a citizen of the United States, residing at Wayne, in the county of Delaware, State of Pennsylvania, have invented a new and useful Improvement in Automatic Damper-Regulators, which improvement is fully set forth in the following specification and accompanying drawings.

My invention consists of improvements in automatic damper-regulators, the novel features of which will be hereinafter set forth, and specifically pointed out in the claims.

Figure 1 represents a side elevation of a portion of a direct indirect steam-heating system embodying my invention, the casing and walls of the apartment being shown in sections. Fig. 2 represents a side elevation of a portion of a direct indirect steam-heating system, the casing and floor being shown in sections. Fig. 3 represents, on a reduced scale, a side elevation of a portion of a direct indirect steam-heating system, showing the manner of piping and connecting the radiator and its adjuncts. Fig. 4 represents, on an enlarged scale, a perspective view of the base or casing employed, the latter being shown in detached position. Fig. 5 represents a side elevation of a portion of a direct indirect steam-heating system, the lower portion of the same being shown in section.

Similar letters of reference indicate corresponding parts in the several figures.

Referring to the drawings, A designates the lower portion of a radiator employed in a direct indirect steam-heating system, and B a base or casing partly inclosing the lower portion of the same, said casing consisting of the upright sides C, one of which has an opening D leading into the apartment in which the radiator is located, while from the other side the passage E extends through the walls of the apartment into the exterior air, the grating F being located at the terminal of said passage E, if desired, as seen in Fig. 1.

G designates a damper employed, which is pivoted at the point H below the radiator A, the casing B being provided with an upright partition H', located below said pivotal point. J designates a weight or counterbalance attached to said damper G, the movement of the latter being limited in either direction by means of the ledges K and L, attached to either side of the sides C.

M designates a plunger or rod attached to the diaphragm P of the damper-regulator N, the construction of the same being evident from the sectional view in Fig. 5. Q' designates a pipe leading from the top of said damper-regulator to the interior of the radiator A, as will be understood from Figs. 1, 2, and 5, whereby it will be seen that any variations of the steam-pressure within the radiator will actuate the plunger M, thereby imparting the desired extent of movement to the damper G, the plunger contacting with the same at one side of its pivotal point.

In Fig. 2 is shown a construction similar to Fig. 1, the lateral passage E, however, being replaced by the upright passage E', as may be expedient under some conditions, the damper G being pivoted at the point H^2 and provided with the counterbalance J, as before, while the extent of movement of said damper is limited by ledges K' and L', the relative arrangement and location of the same being evident from Fig. 2.

In Fig. 3 I have shown another embodiment of the principle of my invention, the connection to the regulator N being made from the radiator A through the medium of the pipe N^2, the action of the plunger M upon the damper G being the same as above described, the device shown in Fig. 3 being applicable to direct indirect steam-heating systems.

The operation is as follows: Reference being first had to Figs. 1, 2, 4, and 5, it will be apparent that the damper G is to be carefully balanced and so arranged as to close the opening to the exterior and leave the opening in the interior open, or vice versa, according to its position in the casing B, the damper being so adjusted that it takes the position wherein the outside air is shut off and the base of the radiator is open to the air of the room at all times except when the pressure of steam in the radiator is so great as to operate the damper so as to entirely open the passage E, as shown in Fig. 1. The partition H' (seen in Fig. 1) prevents the air from passing directly from the outside to the interior of the apartment at such times as the damper occupies the middle position between the two openings.

The diaphragm P, which is used in the damper, is of special construction, carefully adjusted, and is connected directly with the radiator, either inside or outside of the base, as may be desired, or with the piping which supplies the radiator with steam, and is so connected with the plunger M that when actuated by an excess of pressure of steam in the radiator it depresses the adjacent end of the damper with which it is in contact, so as to open the passage E, and thus admit of the entrance of the cold air without to the base of the radiator.

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

1. A radiator having a casing or conduit located adjacent thereto and opening into an apartment, a passage leading from the exterior air into said conduit, a damper located in said conduit and adapted to control said opening and said passage, a chamber having a diaphragm therein, and in communication with the interior of said radiator, a plunger attached to said diaphragm, and adapted to actuate said damper, and stops to limit the movement of the latter.

2. In combination with a radiator, a casing or base located adjacent the lower portion of the latter, a conduit leading thereto from the exterior air, and an opening into said casing from the apartment in which the radiator is located, a counterbalanced damper pivotally mounted in said casing and adapted to control said conduit and said opening, an upright partition in the latter extending from the pivotal point of said damper to the base of said casing, means for limiting the movement of the damper, a regulator mounted adjacent the latter and provided with a plunger having one end adapted to actuate said damper, the other end of said plunger being connected with the diaphragm connected with the radiator, and connections intermediate the regulator and radiator.

3. The combination of a radiator, with a base or casing, an opening in one side of said casing to admit air from the apartment in which the radiator is located, a passage leading from the exterior into said casing, a balanced damper within said casing intermediate said passage and opening and adapted to control the ingress of the exterior air, and means for automatically operating the same by the variations of pressure of the heating medium in the radiator or its connections.

CHARLES F. WOOD.

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