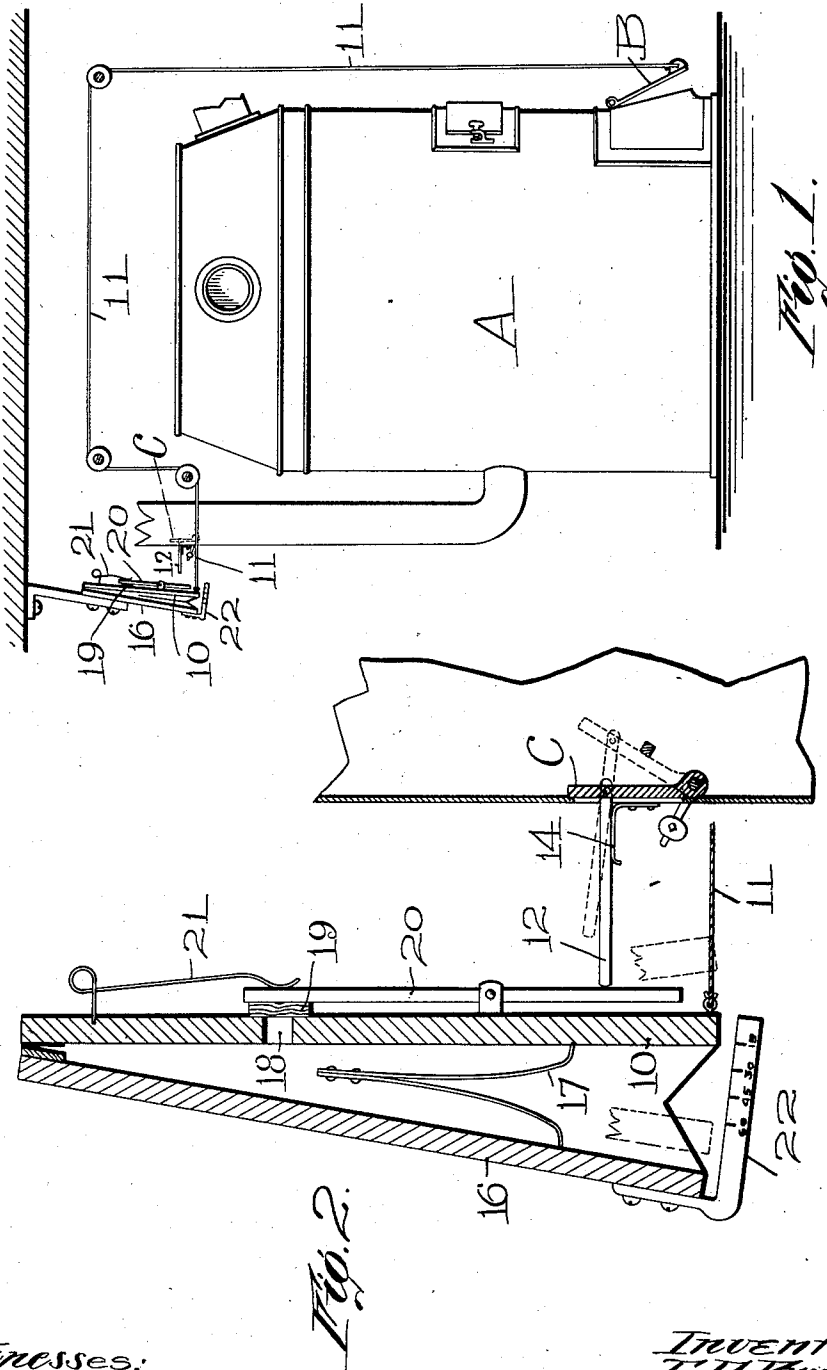


T. P. BROWN.
FURNACE CONTROLLING DEVICE.
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1,009,466.

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UNITED STATES PATENT OFFICE.

THEODORE P. BROWN, OF WORCESTER, MASSACHUSETTS.

FURNACE-CONTROLLING DEVICE.

1,009,466.

Specification of Letters Patent. Patented Nov. 21, 1911.

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To all whom it may concern:

Be it known that I, THEODORE P. BROWN, a citizen of the United States, residing at Worcester, in the county of Worcester and State of Massachusetts, have invented a new and useful Furnace-Controlling Device, of which the following is a specification.

This invention relates to a system for operating and controlling the regulating drafts and dampers of heater and is applicable to substantially all kinds thereof.

The principal objects of the invention are to provide a construction of this character which can be applied to the drafts and dampers without altering them in any way, and which will restore these heater regulating devices to normal condition, that is to the condition in which the draft is checked, after the lapse of a definite amount of time; to provide a construction which can be made to accomplish this restoring action in the full period of operation of the device or in any fraction thereof; to provide for gradually operating the controlling device up to a certain point and then completing the operation rapidly; and to provide a construction of an exceedingly simple form which has no parts that will get out of order in ordinary usage.

Further objects and advantages of the invention will appear hereinafter.

Reference is to be had to the accompanying drawings, in which—

Figure 1 is a side view of an ordinary type of furnace or heater showing a preferred embodiment of this invention applied thereto; and Fig. 2 is a sectional view in a plane parallel to the plane of Fig. 1 on enlarged scale of the regulating pneumatic therefor.

The furnace A is shown as provided with an ordinary type of front damper B and check draft C. These are both shown as connected with a pivotally movable member 10. The damper in this instance is shown as connected with it by a flexible connection 11 passing over pulleys, while the check draft is shown as having a pivoted rod 12 extending therefrom and guided by a guide

14 to a position to engage the member 10. gravity. This movable member 10 is shown in extreme position, this rod engages it, and when the movable member 10 moves to the position shown in Fig. 1 it obviously is out of engagement. In the first position the movable member positively opens the check draft and allows the front damper to close by its own weight, thus checking the fire, while in the second position the opposite effect is secured, the check draft closing by gravity. This movable member 10 is shown as the pivoted leaf of a pneumatic 16. It is normally held expanded by a leaf spring 17 or the like and is provided with a port 18 for the escape and entrance of air. This is covered by a valve 19 on a lever 20 which can be turned against the resistance of a spring 21 to fully open the port 18 when collapsing the pneumatic, but will be automatically moved by the spring into a position to cover the port and restrict the passage of air therethrough; it being understood that the passage of air into the pneumatic is never entirely prevented. Mounted at a convenient position, preferably on the stationary part of the pneumatic is a scale 22 graduated in any desired way, but preferably in convenient units of time. In this case the zero point of the scale is at the point with which the movable leaf 10 registers when the pneumatic is entirely expanded, and it is graduated to show the length of time required for the spring 17 to expand the pneumatic when the movable leaf is depressed to the different points of the scale. It is to be observed that the rod 12 is shown as bearing directly on the lever 20.

The operation of the device is very simple. If it is desired to create a draft in the furnace and have it stopped at the end of a period of time represented by the maximum division on the scale, the valve 19 is operated to open the port 18 and the movable leaf is depressed to the maximum extent until it registers with the largest reading on the scale, as shown in dotted lines in Fig. 2. The valve 19 is then released so that the

spring causes it to cover the port and the device is left in that condition. As the air gradually enters and allows the spring 17 to expand the pneumatic, the leaf 10 moves back and the front draft B gradually closes. It will not close entirely of course until the pneumatic is entirely expanded beyond the position shown in the drawings. During the first part of this operation the check draft C is not affected, but just before the end of the stroke of the movable leaf the lever 20 will engage the end of the rod 12. The resistance thus met overcomes the spring 21 and opens the valve 19. This allows the air to flow in freely and the spring 17 to act quickly. This immediately closes the damper B, and opens the check draft as shown in dotted lines in Fig. 2. If it is desired to have these parts operate in a shorter time than that represented by the highest division of the scale, the movable member is moved only part way, the scale indicating how far it is to be moved in order to get the desired result.

It will be seen that the construction of the device for operating the ordinary regulating dampers is exceedingly simple and of such character that it will practically last at least during the life time of a furnace, as it has no wearing parts and nothing that is likely to get out of order. At the same time it is exceedingly inexpensive and requires no mechanical knowledge to operate it or even to form such adjustments, as may be required. The final quick operation is a desirable feature.

While I have illustrated and described a preferred embodiment of the invention, I am aware that many modifications can be made therein by any person skilled in the art without departing from the scope of the invention as expressed in the claims. Therefore I do not wish to be limited to all the details of construction herein shown and described, but

What I do claim is:—

1. In a device of the character described, the combination with the regulating devices for a heater, of a pneumatic having a swinging member connected with said regulating devices, constructed and adapted, when in normal position, to allow them to move to a position to check the draft and to withdraw them from that position when moved out of normal position, said swinging member having a restricted orifice for the passage of air, resilient means for resisting the movement of said pivoted member out of normal position and for restoring it to normal position when moved, and means whereby the position of said swinging member is controlled by the flow of air through said port.

2. In a device of the character described, the combination with the regulating devices

of a heater, of a pneumatic having a movable leaf and a restricted orifice for the passage of air, resilient means for normally holding said pneumatic expanded, the movable leaf of said pneumatic being connected to said regulating devices, whereby when said pneumatic is wholly or partially collapsed the regulating devices will be operated and will be restored to normal position when the pneumatic is fully expanded.

3. In a heater regulating device, the combination with a check draft and damper, of a pneumatic having a movable leaf, means for connecting said check draft and damper with the movable leaf for holding one of them open and the other closed when the pneumatic is expanded, and for reversing their positions when the pneumatic is collapsed, said pneumatic having a spring for normally holding it expanded, and a restricted orifice for retarding its expansion after it has been collapsed.

4. In a heater regulating device, the combination with a check draft and damper, of a pneumatic having a movable leaf, means for connecting said check draft and damper with the movable leaf for holding one of them open and the other closed when the pneumatic is expanded, and for reversing their positions when the pneumatic is collapsed, said pneumatic having a spring for normally holding it expanded, a restricted orifice for retarding its expansion after it has been collapsed, and a scale for showing how far the pneumatic is collapsed, whereby the time required for operating the check draft and damper may be estimated.

5. In a heater regulating device, the combination with a check draft and damper, of a pneumatic having a movable leaf, means for connecting said check draft and damper with the movable leaf for holding one of them open and the other closed when the pneumatic is expanded, and for reversing their positions when the pneumatic is collapsed, said pneumatic having a spring for normally holding it expanded, a restricted orifice for retarding its expansion after it has been collapsed, and means for fully opening said orifice near the end of the expansive movement of the movable leaf.

6. In a heater regulating device, the combination with a check draft and damper, of a pneumatic having a movable leaf and a spring for normally moving said leaf to expanded position, said leaf having a port, means for connecting said check draft and damper with the movable leaf for holding one of them open and the other closed when the pneumatic is expanded, and for reversing their positions when the pneumatic is collapsed, a lever pivoted on said leaf, a valve for said port connected with and op-

erated by said lever, resilient means for
keeping said valve closed, and means for
operating a draft or damper located in posi-
tion to be engaged by said lever when the
5 pneumatic expands nearly to limiting posi-
tion and to swing the lever and open the
valve.

In testimony whereof I have hereunto set
my hand, in the presence of two subscribing
witnesses.

THEODORE P. BROWN.

Witnesses:

ALBERT E. FAY,
C. FORREST WESSON.

Copies of this patent may be obtained for five cents each, by addressing the "Commissioner of Patents,
Washington, D. C."
