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DRAFT REGULATOR FOR COMBUSTION APPARATUS

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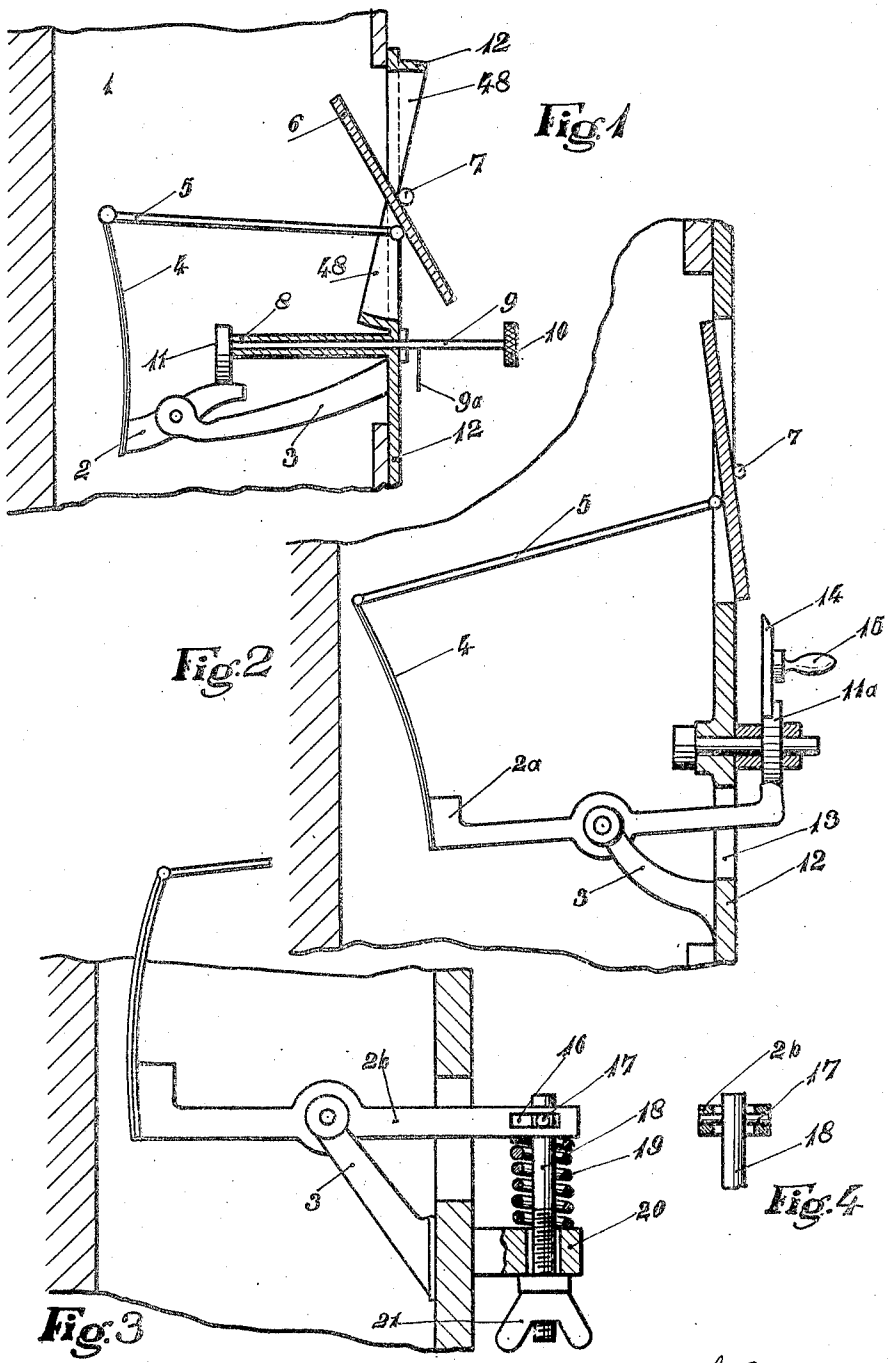


Fig. 1

Fig. 2

Fig. 3

Fig. 4

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DRAFT REGULATOR FOR COMBUSTION APPARATUS

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3 Claims. (Cl. 236—96)

This invention relates to combustion heating installations and in particular to draft regulators for combustion apparatus of the type comprising thermostatic means for controlling the admission of exterior air through a lateral opening into the flue gas conduit of the furnace, regulating in consequence the combustion process by the dependent admission of air under the grate.

It is an object of the invention to provide a thermostatic blade extended within said flue, and members which kinematically connect said blade with a shutter of said opening in the wall of the flue.

A further object of the invention is the provision of a device for varying the relative position of said blade and said shutter by manually operated means situated outside the flue.

In the drawing:

Fig. 1 is a vertical sectional detail of one form of the invention,

Fig. 2 is a similar view of another form of the invention,

Fig. 3 is a vertical sectional detail partly in elevation of a further modification,

Fig. 4 is a fragmentary sectional elevational detail looking toward the right hand side of Figure 3.

In Figure 1 a flue gas conduit or chimney 1 of a furnace, not illustrated, is provided with an opening, which is closed up by a frame constituted by a plate 12 with an opening provided therein. On this frame is fixed an arm 3 which is extended into the interior of the flue 1 and carries the hinge of a lever 2 which, in combination with a bimetallic blade 4 and a connecting rod 5, constitute a device for controlling the draft of the flue gas in the chimney. The blade 4 is at one end fixed to the lever 2 and at the other end rotatably connected to the rod 5, which couples the blade with a shutter 6 mounted rotatably on an axle 7 which crosses the opening from one border of the plate 12 to the other, the shutter being disposed in a way that it can close the opening of the plate 12. The axles of the hinges of the connecting rod 5 on the blade 4 and on the shutter 6 are parallel to the axis 7. The weight of the rod 5 and of the blade 4 acts to tip the lever 2, which, however, rests with its free end against a cam 11 fixed to the end of a shaft 9 rotatable in a tube 8 carried by the plate 12 and extended into the interior of the flue. The end of the shaft 9 projects beyond the plate at the exterior side and has an operating button 10 thereon and a pointer 9a, the position of which can be marked by a scale, not illustrated, on the plate 12.

It will be understood that the button facilitates the turning of the cam 11 which determines the aperture angle of the shutter for a certain curvature of the blade 4, depending on the temperature of the flue gas. The aperture is therefor determined for every temperature higher than that for which the shutter closes the opening completely, if the device is adjusted so that the closing is possible; not that it is necessary in every case, as a permanent draft of air can be desirable, when the temperature is low.

The blade bends freely towards the right hand side when heated, thus opening the shutter. In order to close the opening between two determined limits of temperature the borders of the opening are provided with extended edges.

In Figure 2 the lever 2_a of the thermostat is shaped and mounted in a way that one arm is arranged through a slot 13 in the plate 12, and rests against a cam 11_a mounted on the exterior side of the plate. This cam has a pointer 14 and a handle 15.

In Figure 3 one arm of the lever 2_b of the thermostat is prolongated to the exterior side of the chimney and terminates in a forked arm with a slot 16 in each arm. A bolt 17 fixed to one end of a vertical shank 18 is engaged in those two slots 16; the shank passing through a support 20 fixed to the plate 12 and carrying at its other, screw-threaded end an operating nut 21 and between the support 20 and the lever 2_b a spring 19. The nut 21 facilitates the regulation of the position of the thermostat relative to the fixed parts of the apparatus, with the same results as described under Fig. 1 and 2.

If the shutter when closing is met by a stop, the blade bending to the left hand side tries to tip the lever 2_b in clockwise direction and consequently to compress the spring 19, whereby the spring is weak enough that the blade will support the resulting strain without being damaged.

It must be noticed that the strains supported by the blade 4 are very little because the shutter 6 is practically in indifferent equilibrium on its axle and it is mounted in a manner that it follows every movement of the free end of the blade 4.

I claim:

1. In combination with the flue of a combustion apparatus, having a lateral air inlet opening and an aperture and a damper adapted to close said opening, a thermostatic blade disposed with-

in the flue, members kinematically connecting one end of the thermostatic blade with the damper, a bracket fixed inside the flue, a lever extending transversely within the flue and pivotally mounted on the bracket, one end of said lever being secured to the other end of the thermostatic blade while the other end of said lever extends through the aperture, an adjusting device outside the flue cooperating with the projecting end of the said lever for varying the relative positions of the blade and the damper with respect to each other, and means outside the flue for operating said device.

2. In combination with the flue of a combustion apparatus, having a lateral air inlet opening and an aperture and a damper adapted to close said opening, a thermostatic blade disposed within the flue, members kinematically connecting one end of the thermostatic blade with the damper, a lever extending transversely within the flue and pivotally mounted on the inside of the flue wall, one end of said lever being secured to the other end of the thermostatic blade while the other end of said lever extends through the aperture, a cam disposed outside the flue and rotatably mounted on the flue wall, said cam being adapted to cooperate with the projecting end of said lever for varying the relative positions of the blade and the damper with respect to each other, and a handle on said cam for manually operating the same.

3. In combination with the flue of a combustion apparatus, having a lateral air inlet opening and an aperture and a damper adapted to close said opening, a thermostatic blade disposed within the flue, members kinematically connecting one end of the thermostatic blade with the damper, a lever extending transversely within the flue and pivotally mounted on the inside of the flue wall, one end of said lever being secured to the other end of the thermostatic blade while the other end of said lever extends through the aperture and is in the shape of a fork having a slot in each of its prongs, a support fixed to the outside of the flue wall, a screw threaded shank passing said support and slidable therein, a pin rigid with one end of said shank and engaging the slots in the fork-shaped end of the lever, an operating nut seated on the other end of said shank and bearing against said support, and a spring on said shank, bearing on the one side against the support and on the other side against a fork-shaped end of the lever, so as to turn said lever against the spring action when exerting a traction on said shank by means of said operating nut.

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