To all whom it may concern:

Be it known that I, JOSEF MÖDLINGER, a subject of the Emperor of Austria-Hungary, residing at Budapest, Austria-Hungary, have invented certain new and useful Improvements in Smoke-Consuming Furnaces, of which the following is a specification.

The smoke-consuming devices known heretofore and using a secondary air-supply over the fire for the complete burning of the smoke have the common drawback that they are not equally suited for all classes of fuel. It is a well-known fact that the gas production of the various classes of fuel is not the same during the successive stages of the combustion. With some the gas production diminishes almost constantly. With others the decrease in the gas production, rapid at the beginning, is but very slow at the final stages of the combustion, while yet others produce the gases almost uniformly during the whole combustion, and the gas production decreases rapidly only at the final stage.

The present invention relates to smoke-consuming devices equally suited for all kinds of fuel, requiring only one part to be changed to suit the fuel selected. On this account uniformity of manufacture is attained.

The invention is illustrated in the accompanying drawings, in which—

Figures 1 and 2 show, in front elevation and transverse section, respectively, a fire-box door provided with an apparatus for the admission of the secondary air. Fig. 3 shows a detail. Figs. 4 and 4a show two different forms of cam adapted for different kinds of fuel. Figs. 5, 6, and 7 are detail plan views of the door and cooperating parts in three different positions as assumed at different stages of combustion.

The operation of the apparatus illustrated in the figures is as follows: When the grate is uncharged, the damper 2, by means of its chain 33 passing over pulleys 32 and 35, will have pulled piston 1 up to the top of cylinder 16, and the position of the lever 4, fixed on the hinge of the fire-box door relatively to that of guide-bar 7 and lever 8, is as shown in Fig. 5. The lever 4 at its free end carries the curved arms 5 and 6, the arm 5 being arranged below the arm 6, as shown in Fig. 1, and said arm 6 being shorter than arm 5. 7

is a guide-bar attached to the piston-rods and located in the path of arm 5, and 8 is a lever arm for actuating the valve 9, said lever-arm being located in the path of the arm 6, but above the arm 5. When the door is fully opened, the position of the lever 4 is that shown in Fig. 6. When the fire-box door 3 is opened, the lever 4, fixed on the door-hinge, moves backward, so that its arm 5 strikes against the guide-bar 7 and turns aside the arm 6 to be clear of the lever-arm 8, so that the valve 9, mechanically connected to the lever 8, is not affected. On shutting the fire-door after charging, the arm 5, meeting the bar 7, presses the arm 6 against the lower end of lever 8, Fig. 7, thus opening the valve 9. Compressed fluid is thus allowed to enter the cylinder 16 above the piston 1 and to force it down, whereby the damper 2 is rapidly opened. As the piston descends the guide-bar 7, attached to the piston-rod, clears the arm 5, allowing the fire-box door to be shut and at the same time moving the wedge-piece 13 through the link 10, lever 11, and link 12, so as to allow the flap 14 to descend.

In this position of the apparatus the draft of the furnace draws in secondary air through the opening afforded by flap 14. During the combustion the weight of the damper 2 raises the piston 1, forcing the compressed fluid through the valve 17, the passage of which can be more or less throttled. At the same time the wedge-piece 13 is moved to the left, closing the flap 14. By modifying suitably the contact-surface of said wedge,—i.e., by substituting for it another suited for the fuel used—the device is rendered applicable to all kinds of fuel. When, for instance, the gas production during the combustion is almost uniform, a straight-line contact-surface of the wedge-piece, as shown at 13 in Fig. 1, is best. When, however, the decrease in the gas production, rapid at the beginning, is but very slow at the end, a concave-shaped contact-surface is used, such as 132, while a convex contact-surface, such as 133.

Fig. 4, is recommended for fuels, the gas production of which rapidly decreases at the final stage of the combustion.

In the above-described arrangement the speed of downward movement of the damper 2 is constant; but, obviously, by using a suitably-curved guide-pulley 34, to which the
2. In a furnace, a fuel-door having an air-inlet flap or valve, a weighted damper, an operating-cylinder, a piston therein connected with the damper, a valve constructed and adapted to be operated by the opening of the door to admit fluid under pressure to said cylinder, means whereby the closing of the door closes said valve, a horizontally-slideable rod beneath the door having an operating connection with the piston, a wedge carried by said rod, and a contact-piece carried by the air-inlet flap and designed to bear on said wedge, substantially as described.

In witness whereof I have hereunto set my hand in presence of two witnesses.

JOSEF MÖDLINGER.

Witnesses:

PAUL JOSEPH TOMAUSCROP,
BÖLUKÖY PAT.