

R. C. WADE.
SECTIONAL SMOKE BURNER.
APPLICATION FILED MAR. 18, 1912.

1,057,020.

Patented Mar. 25, 1913.

2 SHEETS—SHEET 1.

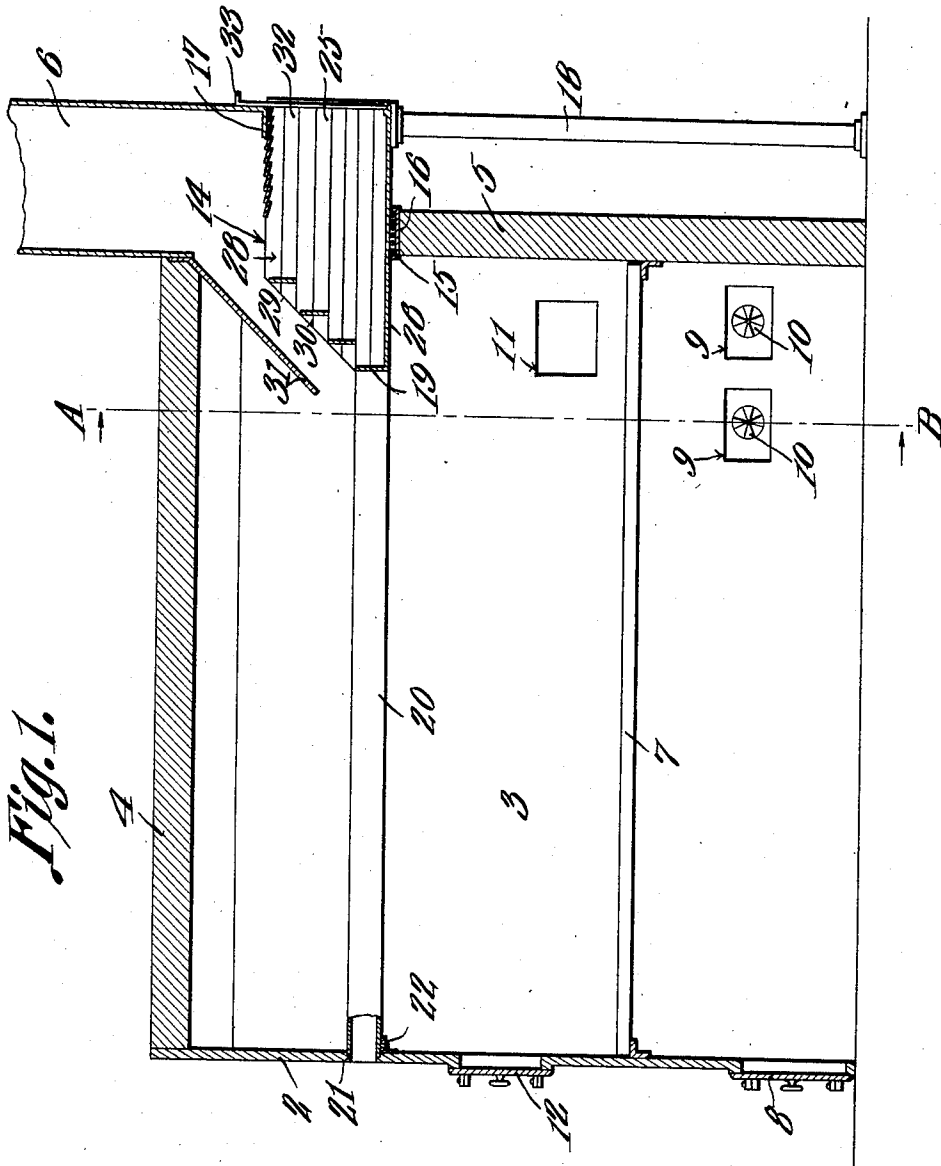


Fig. 1.

Witnesses

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2 SHEETS—SHEET 2.

Fig. 2.

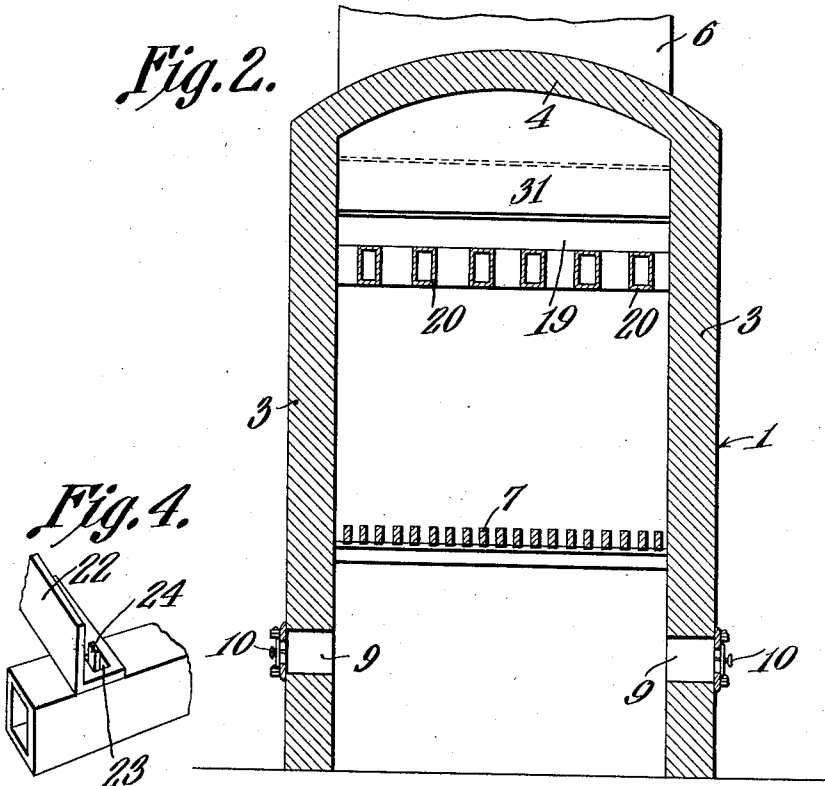
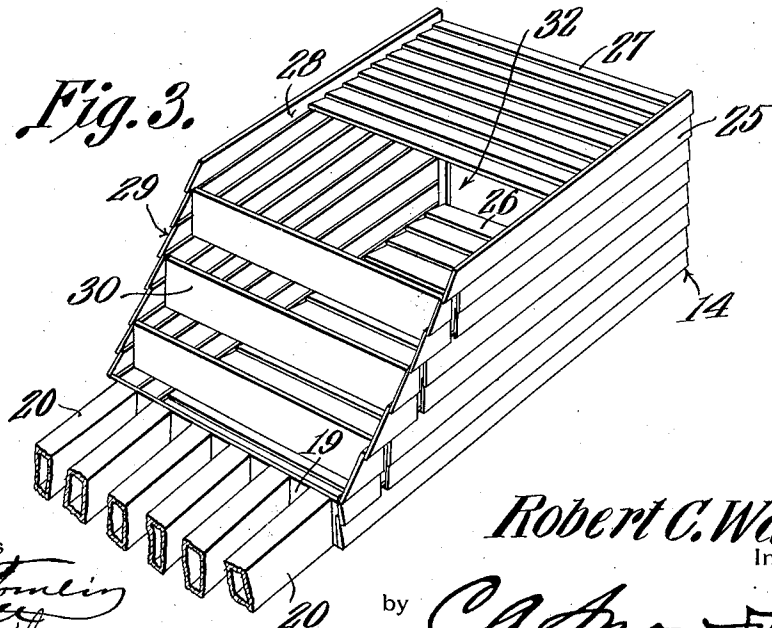


Fig. 4.

Fig. 3.



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UNITED STATES PATENT OFFICE.

ROBERT C. WADE, OF MALDEN, MISSOURI.

SECTIONAL SMOKE-BURNER.

1,057,020.

Specification of Letters Patent.

Patented Mar. 25, 1913.

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To all whom it may concern:

Be it known that I, ROBERT C. WADE, a citizen of the United States, residing at Malden, in the county of Dunklin and State of Missouri, have invented a new and useful Sectional Smoke-Burner, of which the following is a specification.

The objects of the present invention are to provide a device in which air is admitted into the products of combustion of a furnace, before the products of combustion enter the stack, the air being heated before it mingles with the products of combustion; another object of the invention being to provide a fresh-air supply box of novel and improved form.

A further object of the invention is to provide means for controlling the entrance of air into the box and to provide means for controlling the outflowing of the air from the box to the flue of the furnace.

The invention aims further to provide novel means for mounting the air box in such a way that it may expand and contract.

With the foregoing and other objects in view, which will appear as the description proceeds, the invention resides in the combination and arrangement of parts and in the details of construction hereinafter described and claimed, it being understood that changes in the precise embodiment of the invention herein disclosed can be made within the scope of what is claimed without departing from the spirit of the invention.

In the drawings:—Figure 1 shows in vertical longitudinal section, a furnace to which the present invention has been applied; Fig. 2 is a vertical transverse section upon the line A—B of Fig. 1; Fig. 3 is a perspective of the air box; and Fig. 4 is a fragmental perspective showing the interengaging relation between the air flue and its supporting bracket.

In the drawings, the numeral 1 denotes generally, a furnace of any type to which the device constituting the subject-matter of the present invention may be applied. The front wall of the furnace is denoted by the numeral 2, the side walls by the numeral 3, the crown or top of the furnace by the numeral 4, and the rear wall by the numeral 5, the rear wall 5 terminating at its upper edge in spaced relation to the crown 4.

The numeral 6 indicates the stack.

A grate 7 is located within the furnace 1

and extends from the rear wall 5 to the front wall 2, the grate 7 extending transversely between the side walls 3, as shown at Fig. 2. In the front wall 2 below the grate 7 is an ash-door 8, and below the grate 7, adjacent the rear wall 5 there are draft openings 9, controlled by dampers 10 which preferably are carried by suitable closures for the openings 9. In the side walls 3, adjacent the end wall 5 and above the grate 7 are clean-out doors 11. Disposed in the front wall 2 and located above the grate 7 is the usual stoke door 12.

The base of the stack 6 may project rearwardly beyond the wall 5, as shown in Fig. 1, and beneath the base of the stack is an air box, denoted generally by the numeral 14. The box 14 is supported upon anti-friction rollers 15, located within a suitable retaining member 16, carried by the upper edge of the rear wall 5. A projecting foot 17, formed upon the base of the stack 6 engages the upper edge of the air box 14, the air box, if desired, being supported at its outer end by one or more posts 18. The outer, rear end of the air box 14 stands flush with the outer rear face of the stack 6, the inner end of the air box projecting into the furnace 1, past the rear wall 5. The air box 14 includes a front wall 19, through which pass a plurality of flues 20, the flues 20 passing through openings 21 in the front wall 2. The forward ends of the flues 20 are open. A bracket, preferably taking the form of an angle member 22, is secured to the rear face of the front wall 2, and upon the bracket 22 the forward ends of the flues 20 rest. If desired, openings 23 may be fashioned in the horizontal flange of the angle bracket 22, each flue 20 being provided with a depending lug 24, adapted to register in one of the openings 23, to prevent the forward ends of the flues 20 from being withdrawn from the openings 21, when the flues 20 expand and contract. The rollers 15 which are carried by the upper edge of the rear wall 5 permit the necessary expansion, thereby obviating a buckling of the flues 20, or of the air box 14.

The air box comprises side walls 25, a bottom 26, and a top 27, the top 27 being shorter than the bottom 26, so as to define an opening 28 in the top of the air box, adjacent the forward end thereof. The forward edges of the side walls 25 of the air box are inclined, as indicated at 29. Connecting the side walls 25 adjacent the in-

clined edges 29 of the side walls are baffle plates 30 located one above the other and out of vertical alinement. In order to prevent a buckling of the air box when the same is heated, the side walls 25, the bottom 26, and the top 27 are preferably fashioned from a series of overlapping plates, as indicated most clearly in Fig. 3. A deflector 31 extends downwardly and forwardly from the point of union between the stack 6 and the crown 4 of the furnace, the deflector 31 being positioned substantially parallel to the inclined edges 29 of the air box 14. The rear end of the air box 14 is open, as shown at 32 in Fig. 3, the opening 32 being controlled by a sliding damper 33, shown most clearly in Fig. 1.

The operation of the device is as follows:—When a fire is built upon the grate 7, the products of combustion will pass upwardly and rearwardly, between the deflector 31 and the air box 14, the products of combustion leaving the furnace 1 by way of the stack 6. Air will enter the forward ends of the flues 20, and be heated by the fire upon the grate 7. The heated air will enter the air box 14 and be deflected upwardly by the baffle plates 30, the heated air mingling with the products of combustion, beneath the deflector 31, and effecting a thorough combustion of the suspended particles of carbon. If desired, the damper 33 may be opened to the desired amount, permitting air to enter the box 14 through the rear end thereof. The forward end of the box 14 projects in front of the wall 5, and consequently the air within the box, whether entering through the damper 33 or through the flues 20, will be heated in the box, before it passes between the baffle plates 30 to mingle with the smoke. Owing to the fact that the dampers 10 are provided, below the projecting forward end of the box 14, a hot fire may be maintained in front of the wall 5, for the purpose of heating the projecting forward end of the box 14. The clean-out door 11 permits that portion of the fire upon the grate 7 which lies beneath the forwardly projecting end of the box 14 to be

maintained clear and bright, independently of the stoke door 12, the maintaining of a hot fire adjacent the rear wall 5 being a matter of difficulty, when the fire is controlled through the stoke door 12 alone.

The air-box 14 and its associated flues 20 may be removed readily from the furnace, without the use of tools, the anti-frictional mounting of the box 14, indicated at 16, serving to prevent the box and the flues from becoming distorted, due to the heat from the fire upon the grate 7.

Having thus described the invention, what is claimed is:—

1. In a device of the class described, a furnace including a rear wall and a front wall, there being a smoke outlet above the rear wall; an air-box mounted to slide upon the rear wall; a flue opening into the forward edge of the air-box, the flue opening through the front wall of the furnace; interlocking elements upon the flue and upon the front wall of the furnace for holding the flue and the air-box removably in place, the furnace being open between the upper edge of the rear wall and the smoke outlet, to provide for the removal of the air-box and the flue.

2. In a device of the class described, a furnace having a rear wall and a smoke outlet above the rear wall; a grate within the furnace and connected with the rear wall; an inclined deflector located adjacent the smoke outlet; and an air-box supported upon the rear wall and having a thin, conducting bottom overhanging the grate, the air-box discharging against the deflector; and separate means for introducing air into the box from either end of the box; the air box being provided with a series of vertically stepped baffle plates located below the deflector and between said means.

In testimony that I claim the foregoing as my own, I have hereto affixed my signature in the presence of two witnesses.

ROBERT C. WADE.

Witnesses:

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