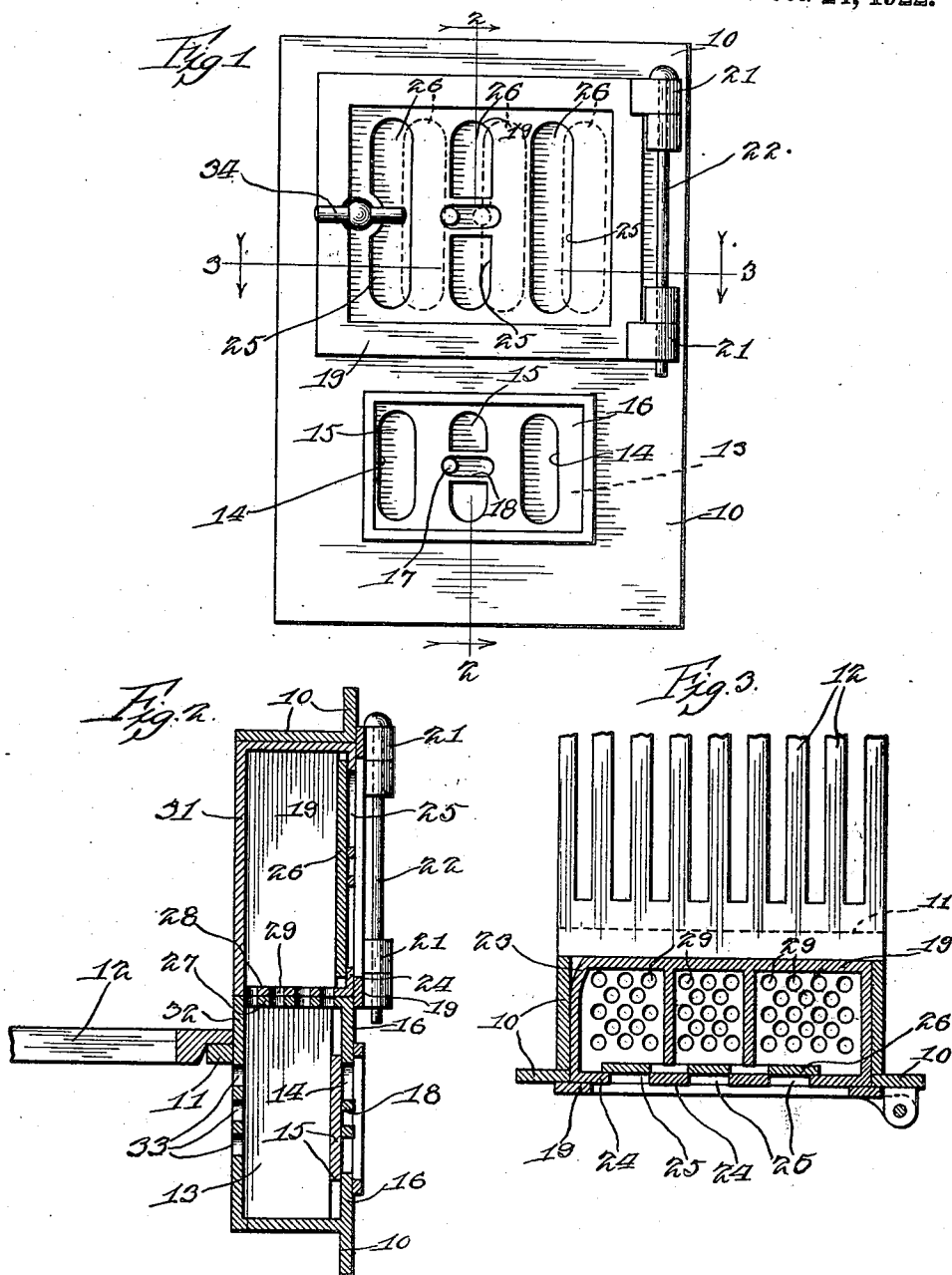


A. BURKART.
FIRE BOX.
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1,432,835.

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Witness:

Clark Magnusson.

Inventor:

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UNITED STATES PATENT OFFICE.

AUGUSTIN BURKART, OF BERN, SWITZERLAND.

FIRE BOX.

Application filed February 13, 1920. Serial No. 358,511.

To all whom it may concern:

Be it known that I, AUGUSTIN BURKART, a citizen of the Republic of Switzerland, residing at Hotel Laube, 12 Bern, in the city of Bern, in the Canton of Solothurn, Switzerland, have invented certain new and useful Improvements in Fire Boxes, of which the following is a specification.

My invention relates to fire box construction and has for its primary object the provision of an improved construction for fire boxes whereby the air supply to the fire may be pre-heated at will, to the end that coal may be saved, the production of smoke retarded, and a very complete combustion of coal attained.

Other objects and advantages of my invention will appear from the following description, taken in conjunction with the accompanying drawings which form a part of this specification and illustrate the preferred embodiment of the invention.

In the drawings:

Fig. 1 is a front elevation of a fire box constructed in accordance with the principles of this invention;

Fig. 2 is a section on line 2—2 of Fig. 1;

Fig. 3 is a section on line 3—3 of Fig. 1.

Reference numeral 10 indicates a preferably rectangular frame of iron forming a part of the front wall of a fire box and which, by means of a rib 11, cast on its inner side, supports the forward end of the fire grate generally indicated at 12; this fire grate being in the ordinary manner supported above the bottom of the fire box to divide the same into an ash pit and a superposed fire chamber. The lower portion of frame 10 is formed with a box-like air chamber 13 the greater portion of which is disposed below the level of the grate 12. The forward wall of chamber 13 is provided with a plurality of draft apertures 14 which may be opened or closed in the ordinary manner by means of a similarly apertured slide damper 15 mounted to slide from right to left against the rear face of the front wall 16 of chamber 13. Normally the damper 15 is closed as seen in Figs. 1 and 2, but, by means of the usual handle 17 sliding in a horizontal slot 18 it may be opened wholly or partly at will. Above chamber 13 the frame 10 receives a box-like door generally indicated at 19, this door being provided with hinge lugs 21 to swing on a hinge pintle 22, the latter being carried in

frame 10. In order to facilitate the closing and opening of the door 19, its free vertical edge, along the inner side, is curved away from frame 10 as indicated at 23 in Fig. 3. The door 19 has its forward wall 24 provided with a series of spaced vertical apertures 25 which are controlled by means of a draft gate 26 horizontally slidable against the rear face of wall 24 in the usual manner, being movable to one side as indicated in dotted lines in Fig. 1 to partially or wholly open the apertures 25. The top horizontal wall 27 of chamber 13 and the bottom horizontal wall 28 of the hollow door 19 are provided with registering apertures 29, while the rear vertical wall 31 of door 19 is imperforate. A small portion 32 of the vertical inner wall of chamber 13 and the entire inner wall 31 of door 19 stand above the top of grate 12 and are thus exposed to the heat of the fire on the grate.

In the operation of my invention, the gate 26 is first closed, damper 15 opened, and a fire started in the usual way, the fire receiving draft from apertures 14 of the draft chamber and oppositely positioned air apertures 33 provided in the inner vertical wall of the air chamber 13. As soon as the fire is started the draft door 15 is closed and the draft gate 26 opened so that the air for the fire is admitted through apertures 25 of door 19, impinges against the hot inner wall 31 of that door, passes downwardly through the apertures 29 into chamber 13, thence through the air apertures 33 to the lower side of grate 12. By the time the draft has reached the bottom of grate 12, it is pre-heated because of its contact with the heated inner wall 31 of door 19 and the heated portion 32 of chamber 13. The result being that the fire burns with a minimum production of smoke and an almost complete combustion of the coal fed to it. A further result of the maximum combustion of coal is a saving of fuel, inasmuch as less coal is needed to develop a given amount of heat than in cases where cold air is fed to the grate. Coal is fed to the grate in the usual way by opening door 19 and charging the fire by shovel or otherwise, following which door 19 is closed by the usual hand latch 34 and the draft gate 26 opened as shown in dotted lines in Fig. 1—or further if desired—to impinge the cold air against wall 31 before it passes beneath the grate.

While I have illustrated and described

the preferred embodiment of my invention, it is obvious that one skilled in the art may make modifications thereof without departing from the spirit of the invention. I wish, therefore, not to be restricted to the precise embodiment shown except in so far as the same is limited in the appended claims. I claim:

1. In a fire box, the combination with
10 means defining an air chamber located in front of and mainly below the grate level, said chamber being apertured in its outer, inner and upper walls, of a damper controlling passage of air through the outer wall
15 of the air chamber, a hollow fire door positioned above said air chamber and having apertures which in the closed position of the fire door register with the apertures in the top wall of the air chamber, and the
20 imperforate inner wall of the said fire door exposed to the heat of a fire on the fire box grate, a perforate outer wall for the fire door, and a draft gate controlling passage of air through the fire door.
- 25 2. The combination with the grates of a fire box, of an air chamber extending below said grates, said air chamber having perforated inner and upper walls, a draft damper for controlling the admission of air

through the forward wall of said chamber, 30 a hollow box-like door disposed above said air chamber and provided at its lower wall with perforations registering with the perforations of said air chamber, and a draft gate mounted on the outer wall of said door 35 through which admission of air to the interior of said door may be regulated.

3. The combination with the grates of a fire box, of a hollow box-like door pivotally mounted above the level of said grates, said 40 door having a perforated lower wall and being provided upon its outer front wall with a draft gate, an air chamber disposed beneath said door and extending below said grates, said chamber having a perforated 45 upper wall communicating through the aforesaid perforations with the interior of said door, and having a perforated inner wall through which air is delivered beneath said grates, and a draft chamber mounted 50 on the outer wall of said fire box through which air may be admitted directly to the box when said chamber is open.

AUGUSTIN BURKART.

Witnesses:

J. ALLENSON,
EZRA REEDER.