

M. C. HAWLEY.
 DOOR FOR BOILER FURNACES.
 APPLICATION FILED JULY 11, 1908.

945,943.

Patented Jan. 11, 1910.

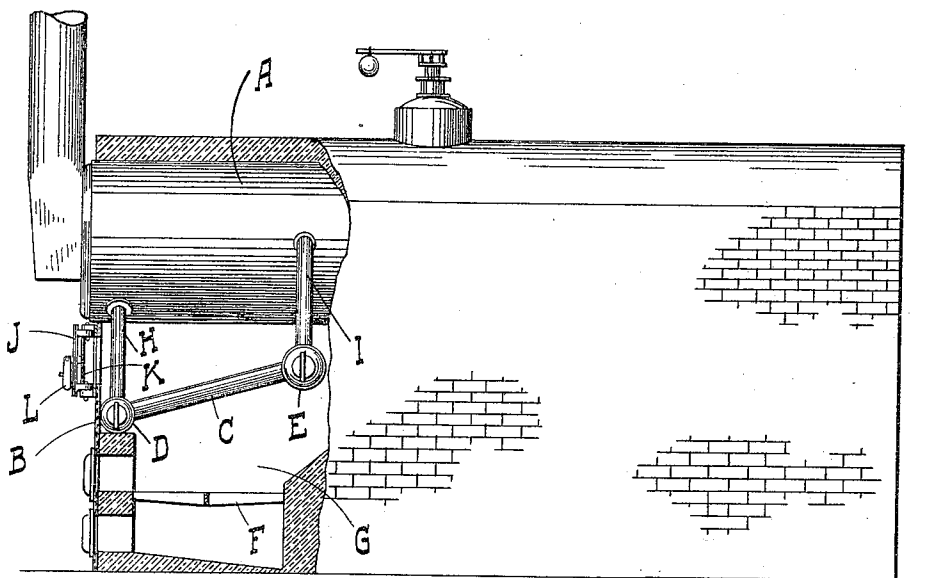


Fig. 1.

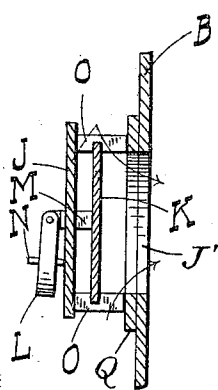


Fig. 4.

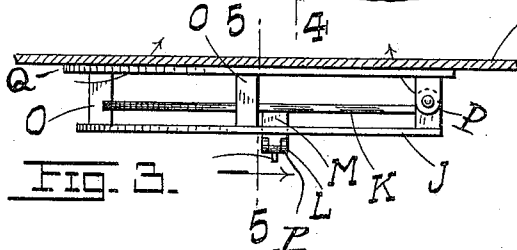
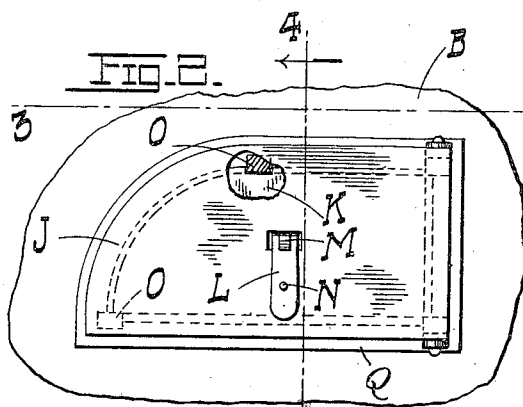


Fig. 3.

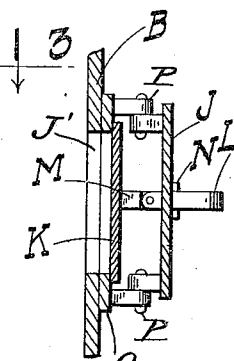


Fig. 5.

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DOOR FOR BOILER-FURNACES.

945,943.

Specification of Letters Patent.

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To all whom it may concern:

Be it known that I, MELVILLE C. HAWLEY, a citizen of the United States, residing in the city of St. Louis, State of Missouri, have invented a new and useful Improvement in Doors for Boiler-Furnaces, of which the following is a full, clear, and exact specification, reference being had to the accompanying drawings, which form a part thereof.

My invention relates to that type of doors used in connection with down draft furnaces for boilers. These furnaces have two grates, an upper and a lower and the coal is fed through a door into the upper grate and the air for combustion passes into the furnace through the same door and then downward through the bed of coal and fire on the upper grate into the space between the upper and lower grates, and then to the chimney.

The object of my invention is to provide a door through which coal may be fed onto the upper grate of a down draft furnace and which will prevent the overheating of the boiler room by radiation through the door opening; and a further object of my invention is to provide a door for a down draft furnace through which coal may be fed to the furnace and air admitted in regulated quantities while diminishing the loss of heat by radiation from the furnace.

My invention is fully shown in the accompanying drawings where similar letters are used to designate similar parts.

Figure 1 shows the door as applied to a down draft furnace under an ordinary fire tube boiler; Fig. 2 is a front view of the door; Fig. 3 is a view of Fig. 2 looking down from the top as indicated by the line 3—3 of Fig. 2; Fig. 4 is a section along the line 4—4 of Fig. 2; and Fig. 5 is a view along the line 5—5 of Fig. 3.

Referring to the figures, A is a boiler with the furnace G beneath it.

B is the front wall of the furnace, and C is the upper grate made of water tubes connected to the headers or drums D and E, which are connected to the boiler A by means of the pipes H and I.

F is the lower grate.

J' is the door opening through which coal is fed onto the upper grate C, and through which air is admitted for the combustion of the coal on the grates C and F. The door consists of the carrier J provided with a

movable shield K, made of an imperforate plate, which is supported on guides O, and which has attached to it a handle having a fixed part M and a swinging part L provided with a pin N. The guides O are attached to the carrier and project forwardly therefrom, and they not only support the shield K but also limit its motion. The carrier J is supported by the hinges P on the part Q of the furnace wall and is provided with an opening through which the parts M and L of the handle pass. The pin N is for the purpose of preventing the handle from slipping through the opening in the carrier when the door is opened. Since the shield K is supported by the guides O, when the carrier J is swung open the shield K swings with it thus leaving a clear opening through which coal may be fed onto the grate C.

When the carrier is closed the ends of the guides O come in contact with the part Q of the furnace wall and keep the carrier at a distance from the front of the boiler equal to the length of the guides, thus providing a space between furnace wall and the periphery of the carrier through which air can pass into the furnace. When the carrier is closed and the shield K is completely pushed in as shown in Fig. 5, the peripheral air passage is closed and little or no air can pass into the furnace; but when it is desired to admit air to the furnace the shield is pulled out to the position shown in Figs. 3 and 4, and then air enters the furnace from all parts of the periphery of the carrier past the shield K, as indicated in Figs. 3 and 4. Fig. 2 represents one shape of the carrier, but it is evident that the shape may be changed to suit various requirements.

The operation of the door is as follows: When it is necessary to supply coal to the furnace, the carrier J is swung open and the shield K is carried with it, thus leaving a clear opening through which coal is thrown onto the grate C; then the carrier is closed and the shield K is adjusted by means of the handle to the proper position on the guides O so that the required amount of air may pass by the shield into the furnace for the combustion of the fuel. When coal is first put on the grate C it is usually necessary to supply a large amount of air for the combustion of the gases evolved from the new coal and, therefore, the shield K is

pulled out so as to admit a large amount of air. After some of the fuel on C has been burned and there is not a demand for so large a quantity of air, the shield K is pushed in so as to partly close the peripheral opening through which air enters the furnace. A part of the air which enters the furnace is used for the combustion of the coal on the grate C, and a part passes downward through the fire on C and is used for the combustion of such coal as may drop from the upper grate C onto the lower grate F. When it is necessary to check the combustion of the coal in the furnace the shield K is pushed in and made to seat on the part Q of the furnace wall, as shown in Fig. 5. By adjusting the position of the shield K on the guides O it is evident that the amount of air admitted to the furnace above the grate C may be regulated as desired, and at the same time the shield K prevents heat from being radiated from the furnace into the boiler room or against the carrier J. Since there is an air space between the shield K and the inside of the carrier, the carrier J is kept comparatively cool and prevented from being burned. The heat radiated from the furnace through the door opening strikes the shield K and as it is of cheap construction it can be easily replaced if burned. It is evident that the size and shape of the carrier J may be varied to suit the dimensions of the grates C and F.

What I claim as new and desire to secure by Letters Patent, is:

1. A furnace door consisting of a plate adapted to seat upon a door opening in a furnace wall, a carrier for said plate provided with guides adapted to support said plate and to permit said plate to be moved into and out of closed position, said carrier being hingedly mounted on said furnace wall, means carried by said plate co-

operating with said carrier to move said plate to opened and closed position, substantially as described.

2. A furnace door consisting of an imperforate flat plate adapted to seat upon a door opening in a furnace wall, a carrier for said plate provided with guides adapted to support said plate and to permit said plate to be moved into and out of closed position, said carrier being hingedly mounted on said furnace wall, means carried by said plate cooperating with said carrier to move said plate to opened and closed position, substantially as described.

3. A furnace door consisting of a flat imperforate plate adapted to seat upon a door opening in a furnace wall, a carrier for said plate provided with guides adapted to support said plate and to permit said plate to be moved into and out of closed position, said carrier being hingedly mounted on said furnace wall, and a handle attached to said plate and projecting backwardly through said carrier, substantially as described.

4. A furnace door consisting of an imperforate flat plate adapted to seat upon a door opening in a furnace wall, a carrier for said plate provided with guides adapted to support said plate and to permit said plate to be moved into and out of closed position, said carrier being hingedly mounted on said furnace wall, a handle attached to said plate and projecting backwardly through said carrier, and a pin through said handle outside said carrier, substantially as described.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

MELVILLE C. HAWLEY.

Witnesses:

THERESA SUEME,
ELLA JUNE.