

(No Model.)

C. BOUGIER.

AIR HEATING AND REGULATING DEVICE FOR FURNACES.

No. 532,863.

Patented Jan. 22, 1895.

Fig. 2.

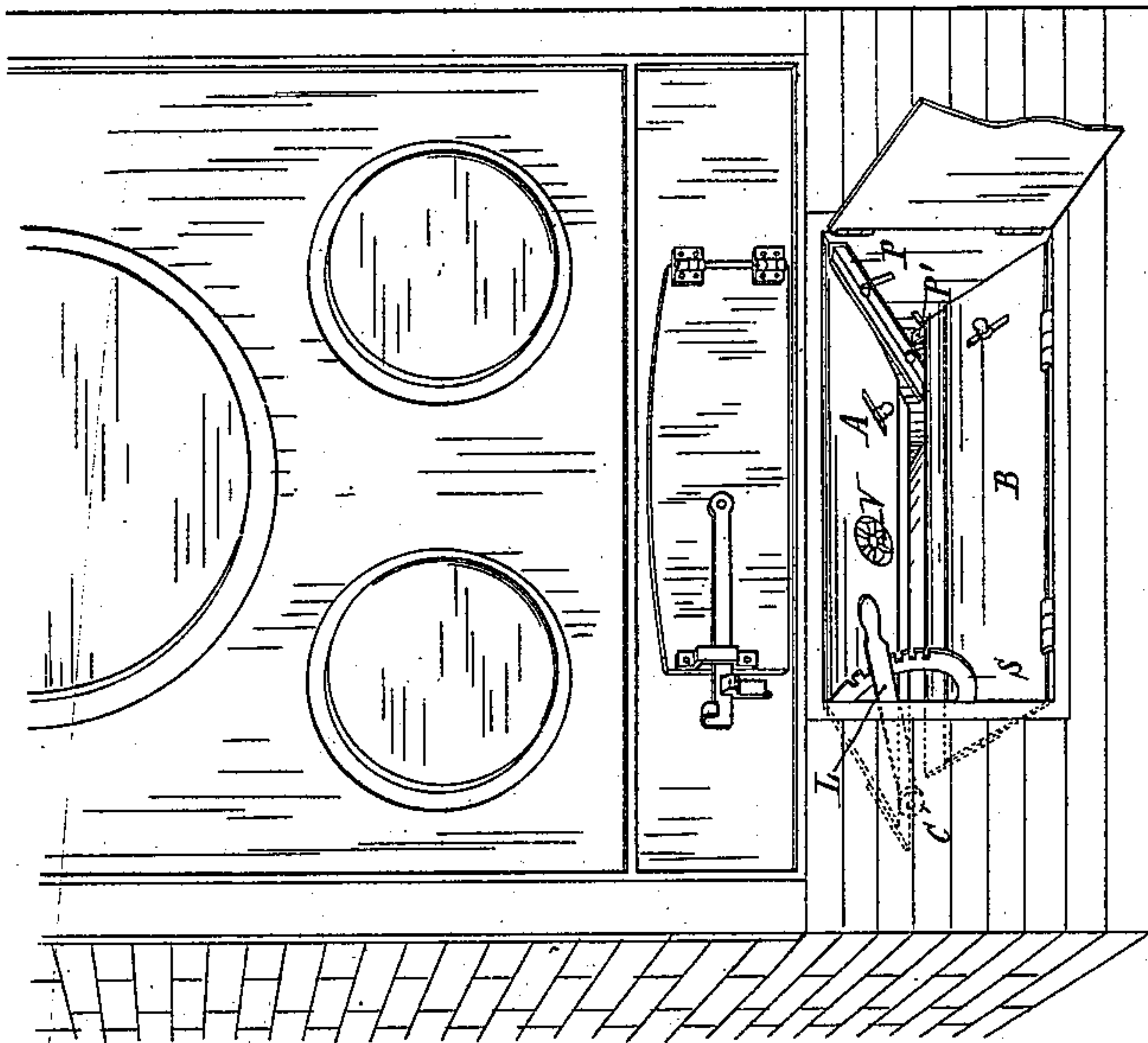
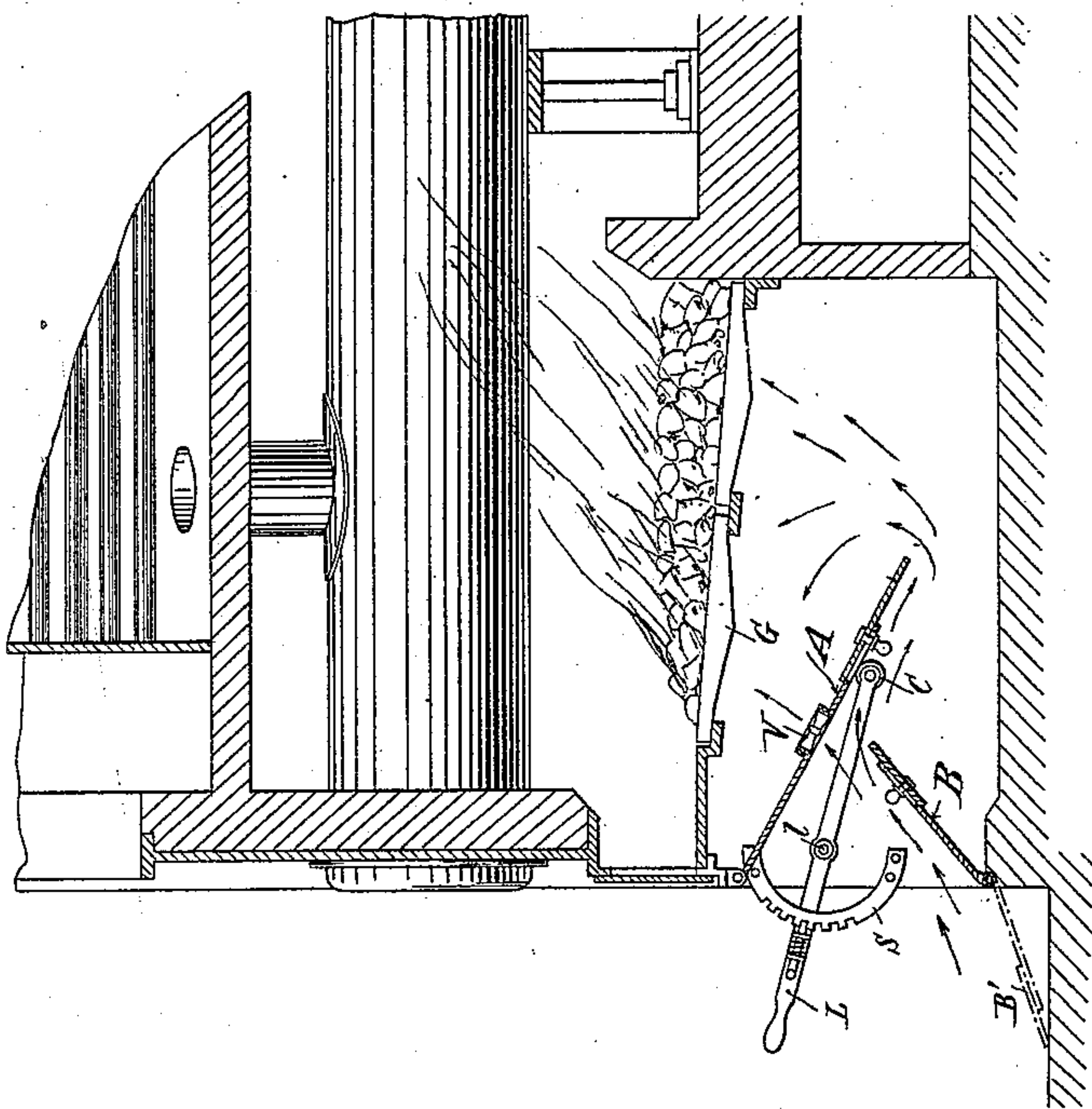


Fig. 1.



Witnesses  
E. W. Eaille  
W. Marshall

Inventor  
Charles Bougier  
by L. M. Rogers  
Attorney



# UNITED STATES PATENT OFFICE.

CHARLES BOUGIER, OF LEVALLOIS-PERRET, FRANCE.

## AIR HEATING AND REGULATING DEVICE FOR FURNACES.

SPECIFICATION forming part of Letters Patent No. 532,863, dated January 22, 1895.

Application filed February 19, 1894. Serial No. 500,810. (No model.) Patented in France December 27, 1893; in Belgium January 20, 1894; in Germany January 23, 1894; in Austria January 29, 1894, and in England January 30, 1894.

*To all whom it may concern:*

Be it known that I, CHARLES BOUGIER, a citizen of the Republic of France, residing at Levallois-Perret, (Seine,) France, have invented a certain new and Improved Air Heating and Regulating Device for Furnaces, (for which patents have been granted to me in the following countries: France, December 27, 1893; Germany, January 23, 1894; Belgium, January 20, 1894; England, January 30, 1894, and Austria, January 29, 1894,) of which the following is a specification.

This invention refers to an improved air heating and regulating device located under the firebars of the furnace near to the ash pit door, whereby the air is heated by the furnace heat while being drawn through the incandescent fuel by the action of the draft produced from the chimney, and the quantity of air admitted is regulated by the same device all as hereinafter described.

The invention will be understood by describing the same with reference to the accompanying drawings.

Figure 1 is a longitudinal section through a steam boiler furnace of ordinary construction showing the air heating and regulating device in position, and Fig. 2 is a front view in perspective of the same furnace, the ash pit door being removed to show the internal parts.

The improved apparatus is composed of two hinged shutters or plates A and B, made of sheet iron, one being situated at the top, and the other at the base of the ash pit entrance. The lower plate B is hinged at its base, and when in position rests on an angle piece P', Fig. 2, fixed on the side of the ash pit. The upper plate A is hinged at its upper edge and is adjustable in position by being turned on its said hinge by means of a lever L pivoted at l and provided with a roller C to act on the upper plate. This lever L is provided with a spring catch bolt calculated to engage with the tooth sector S in such manner that it is easy by operating externally the lever L to adjust the plate A to any desired angle and consequently to give more or less space for the inflow of air between the two plates A and B the minimum space or opening between the plates A B being defined by the angle piece P

Fig. 2, which is adjustable by bolts and slots and prevents the complete closing of the shutters and the consequent extinction of the fire thereby.

Owing to their situation in the ash pit below the grate the plates A and B are heated by the radiated heat from the furnace and the air coming from without is directed, as indicated by the arrows in Fig. 1, by the plate B on to the shutter A which being nearer the furnace has the highest temperature. This air, owing to the draft from the chimney traverses the space left free between the two plates and is greatly heated thereby before and when it comes in contact with the incandescent mass in the furnace. Combustion is thus rendered more complete which produces consequently an economy of fuel and improved smoke combustion.

To increase the inlet of the air which is required in furnaces where rapid vaporization is to be effected I provide the upper plate A with a winged ventilator V which by its rotation injects or allows of the entrance of an additional volume of air under the fireplace G.

The shutters A and B may be built up of several superposed plates so as to be expanded at will by means of ordinary mechanical appliances such as a screw or bolts and slotted holes and the superficial heating area of the shutters A and B may thus be varied according to the heating surface desired to be obtained. For the cleaning-out of the ashpit the shutter B is brought into the position indicated by dotted lines by B'.

I claim—

1. In heating and regulating devices for furnaces, the combination with a lower plate B hinged at its lower edge to the base of the ash pit entrance, of an upper plate A hinged at its upper edge to the top of the ash pit entrance; and means for adjustably supporting the upper plate more or less adjacent to the fire bars and for supporting the lower plate at an angle with the upper plate, whereby the air admitted between the plates is heated by contact therewith and the volume of air admitted is regulated by the distance apart of said plates as set forth.

2. The combination with a lower plate B hinged at its lower edge to the base of the ash



pit entrance with angle piece P' for supporting same in position and an upper plate A hinged at its upper edge to the top of the ash-pit entrance, of a pivoted lever L and retaining catch device for adjusting the angular position of the plate A as set forth.

3. The combination of a lower plate B hinged at its lower edge to the base of the ash-pit entrance with fixed angle piece P' for supporting same in position and an upper plate A hinged at its upper edge to the top of the ash-pit entrance, a rotary winged ventilator V in the upper plate A and a lever L for adjusting the position of the latter, as set forth.

4. The combination with a lower hinged

plate B, a piece P' for supporting the plate B in an angular position, an upper hinged plate A, a pivoted lever L and retaining catch device for adjusting the angular position of the plate A and holding same in position; of the sliding extension plates attached to the plates A and B for increasing the superficial area of same as set forth.

In testimony whereof I have hereunto set my hand in the presence of two subscribing witnesses.

CHARLES BOUGIER.

Witnesses:

T. SHILLIGER,

CLYDE SHROPSHIRE.