

No. 775,930.

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E. S. ORMSBY.

FURNACE.

APPLICATION FILED APR. 20, 1904.

NO MODEL.

Fig. 1.

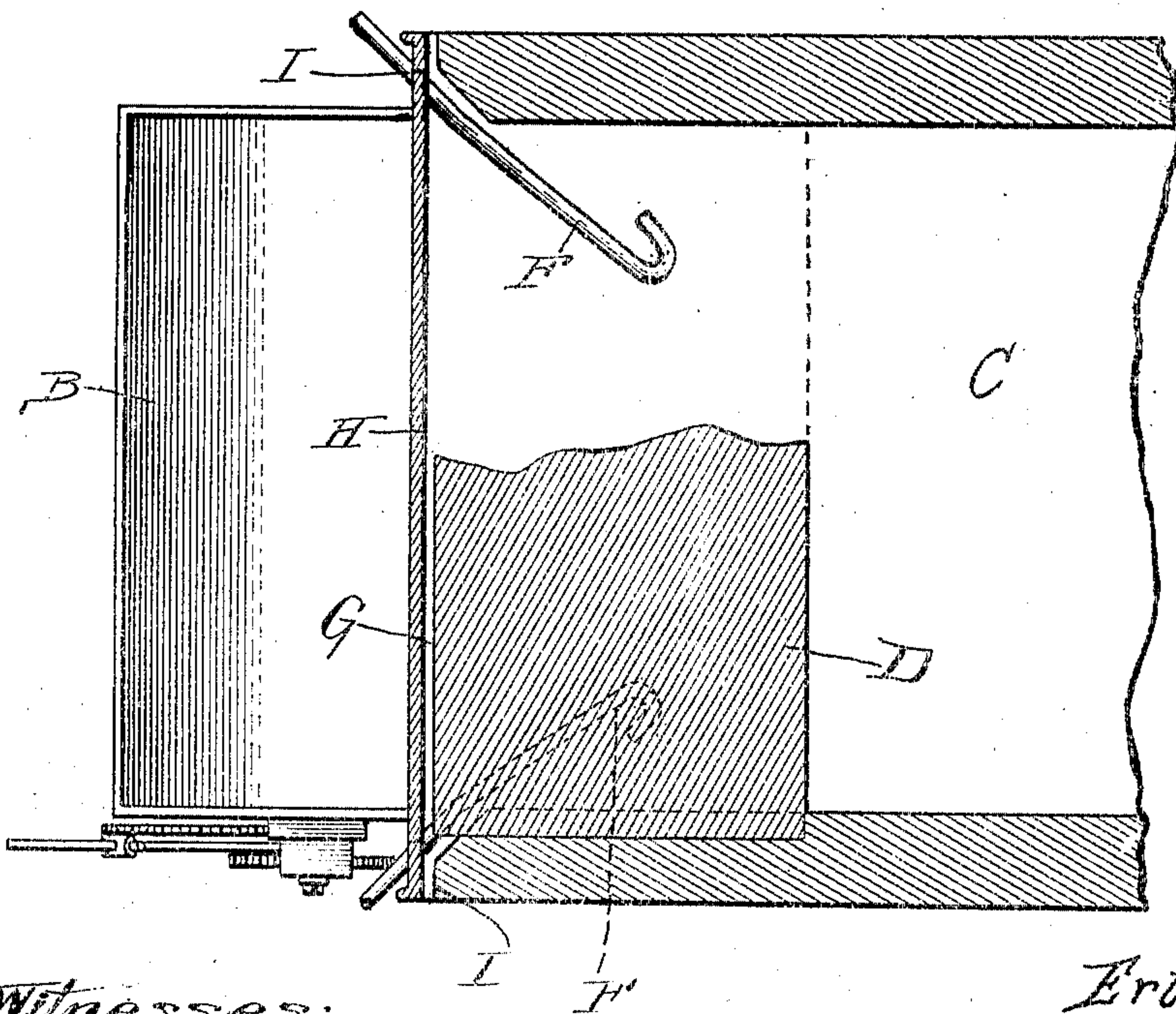
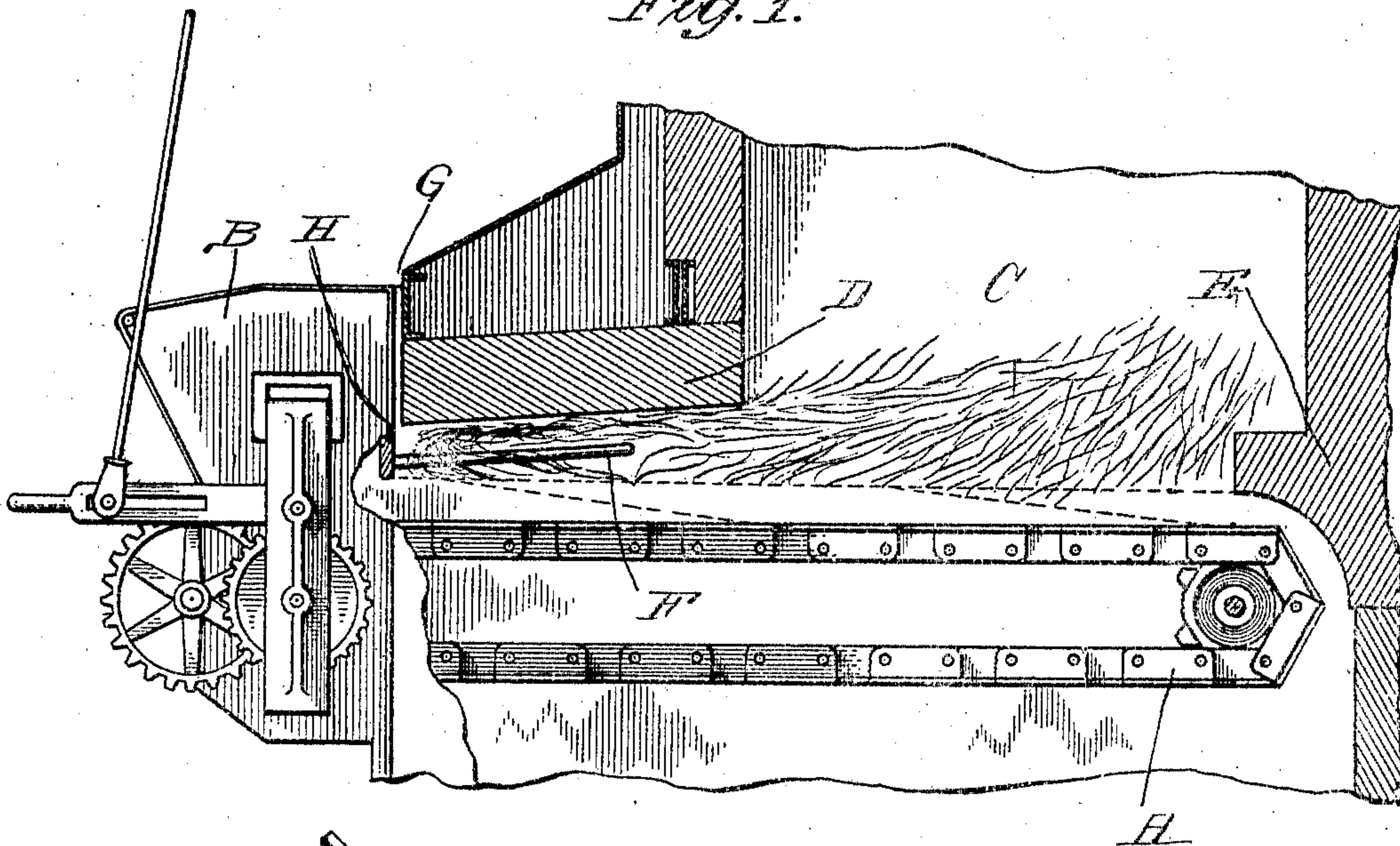


Fig. 2.

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FURNACE.

SPECIFICATION forming part of Letters Patent No. 775,930, dated November 29, 1904.

Application filed April 20, 1904. Serial No. 204,008. (No model.)

To all whom it may concern:

Be it known that I, ERLE S. ORMSBY, a citizen of the United States of America, and a resident of Chicago, Cook county, Illinois, have invented a certain new and useful Improvement in Furnaces, of which the following is a specification.

My invention relates to furnaces of that type in which the coal is fed from a hopper onto a traveling grate. In furnaces of this character an igniting-arch is provided and arranged directly over the opening through which the coal is conveyed from the hopper to the combustion-chamber. The said arch is supposed to be maintained at a high temperature to cause a practically instantaneous ignition of the coal as soon as it enters the combustion-chamber. As is well known, however, considerable difficulty is often experienced in keeping this fire-arch sufficiently hot to ignite the coal, with the result that the fire is apt to gradually die down and perhaps go out.

It is the object of my invention, therefore, to make provision in a furnace of this particular character for insuring the maintenance of the said arch at the high degree of temperature necessary for the instantaneous or proper ignition of the coal as it enters the combustion-chamber from the hopper. Preferably I accomplish the said object of my invention by providing one or more jets of air or steam or other suitable fluid and by so disposing the same in opposition to the furnace-currents that the heat is concentrated upon the arch, or, in other words, in such manner that the flame and burning gases are blown against the igniting-arch, thereby maintaining the latter at the desired high degree of temperature.

As a matter of further improvement I prolong the life of the fire-wall at the front of the furnace by admitting air between said wall and the igniting-arch, and by admitting air at the front of the combustion-chamber I equalize the combustion with less air than has heretofore been considered necessary, and in addition I equalize the temperature of the arch.

The nature and advantages of my invention will, however, hereinafter more fully appear.

In the accompanying drawings, Figure 1 is

a longitudinal section of a furnace embodying the principles of my invention. Fig. 2 is a horizontal section of the forward portion of said furnace.

As thus illustrated, it will be seen that the furnace involves the usual chain grate A, adapted to travel slowly in a direction to carry the coal from the hopper B into the combustion-chamber C, the usual igniting-arch D, and the bridge-wall E. These elements of the construction may, it will be readily understood, all be of any suitable known or approved form.

In general the operation is obvious. The coal is held in the hopper B, from which it is conducted into the combustion-chamber C. The upper leaf of the chain grate A travels inwardly in the direction indicated, thus carrying the coal slowly from the hopper into the combustion-chamber. The usual known or approved means can be employed for operating the grate. The heat of the burning coal is supposed to maintain the arch D at a high degree of temperature and to thus insure ignition of the coal as fast as it enters the combustion-chamber on the grate. In other words, the said arch is maintained practically at the point of incandescence and radiates sufficient heat to ignite the coal as it enters the combustion-chamber from the hopper; but, as previously stated, it often happens that the draft is uncertain, or, in other words, that the heat of the arch is not sufficient to properly ignite the coal. Now in order that a furnace of this character may operate with certainty and efficiency the steam-jet pipes F are provided and arranged in such position that jets of steam are directed toward the front of the furnace in opposition to the general trend of the furnace-currents. These pipes are preferably arranged under the arch, as shown, and with this provision the flames and burning gases are blown forward and upwardly directly against the lower surface of the arch, thus keeping the latter at the temperature necessary for a proper ignition of the coal. Instead of steam air can be employed, if so desired. In fact, any fluid suitable for this purpose may be substituted for steam. The sole function of the jets, whether they be of

steam, air, or other fluid, is, however, to maintain the igniting-arch at the high degree of temperature necessary for insuring a proper ignition of the coal. In other words, the jet or jets of steam or other suitable fluid serve merely as a means for forcing the flame and burning gases against the lower surface of the igniting-arch, so as to preclude all possibility of the temperature of the arch falling to a point which will permit the coal to enter and travel some distance in the combustion-chamber before it ignites.

As a matter of further improvement air is admitted at G between the fire-wall H and the arch D, so as to cool the wall, and thereby prolong its life. Furthermore, air is also admitted to the forward end of the combustion-chamber at I, preferably at the corners. With this arrangement the combustion is equalized throughout the grate and with less air than is employed when the air is all admitted from below the grate. In other words, the combination of a chain grate with means for admitting air to the forward end of the combustion-chamber constitutes an important feature of the invention, inasmuch as it insures a supply of sufficient air at the point where the green coal enters the combustion-chamber and a consequent perfect combustion at that point without passing more air upward through the grate than is necessary for proper combustion of the ignited coal or coal which has passed out from under the arch, and as another advantage the air circulates and keeps all parts of the arch at the same temperature. The said igniting-arch is, it will be seen, positioned close above the forward end of the chain grate, whereby said arch is maintained at a high temperature and whereby the green fuel is ignited by the heat of said arch practically as soon as it enters the combustion-chamber.

What I claim as my invention is—

1. A furnace comprising a traveling grate, means for feeding the coal onto the grate, an igniting-arch for igniting the coal as it enters the combustion-chamber, and means for forcing the flame and burning gases against the said arch to maintain the latter at the proper temperature.

2. A furnace comprising a traveling grate, a hopper for feeding the coal onto the grate, an igniting-arch for igniting the coal as it enters the combustion-chamber, and means positioned to direct steam across the burning bed of coal in a direction tending to force the flames and burning gases against the under side of said igniting-arch, whereby the latter is maintained at the proper temperature.

3. A furnace comprising a suitable traveling grate, means for feeding the coal onto the grate, an igniting-arch extending over the

grate and adapted when heated to ignite the coal carried into the combustion-chamber on the grate, and suitable means for directing one or more fluid jets across the bed of burning coal in a direction tending to force the flames and burning gases against the said igniting-arch, whereby the latter is maintained at the proper temperature.

4. In a furnace, the combination of a chain grate, a hopper for feeding the coal onto the grate, an igniting-arch extending across the grate and adapted when properly heated to ignite the coal carried into the combustion-chamber on the grate, and means for blowing the flame and burning gases backward and upward and against the under side of the igniting-arch, whereby the latter is maintained at the proper temperature.

5. A furnace provided with a chain grate with means for feeding the fuel onto said grate and also with means for blowing the flame and heat against the green coal or other fuel as it enters the combustion-chamber.

6. A furnace having a chain grate and an igniting-arch, and having also a fire-wall, there being space between the fire-wall and arch for admitting air to the combustion-chamber, the said igniting-arch being positioned close above the forward end of the chain grate, whereby the green fuel is ignited by the heat of said arch as soon as it enters the combustion-chamber.

7. A furnace having a chain grate and an igniting-arch, and having also a fire-wall through which the fuel enters the furnace, and cold-air inlets for cooling said fire-wall, the said igniting-arch being positioned close above the forward end of the chain grate, whereby the green fuel is ignited by the heat of said arch as soon as it enters the combustion-chamber.

8. A furnace having a chain grate and an igniting-arch, and means for admitting air directly to the forward end of the combustion-chamber above the fuel, the said igniting-arch being positioned close above the forward end of the chain grate, whereby the green fuel is ignited by the heat of said arch as soon as it enters the combustion-chamber.

9. A furnace having a chain grate and an igniting-arch, and means for admitting air at the forward corners of the combustion-chamber, the said igniting-arch being positioned close above the forward end of the chain grate, whereby the green fuel is ignited by the heat of said arch as soon as it enters the combustion-chamber.

Signed by me at Chicago, Cook county, Illinois, this 14th day of April, 1904.

ERLE S. ORMSBY.

Witnesses:

SEVERINUS B. CHABOWSKI,
WM. A. HARDERS.