

No. 776,539.

PATENTED DEC. 6, 1904.

E. S. ORMSBY.
FURNACE.

APPLICATION FILED JAN. 8, 1904.

NO MODEL.

Fig. 1

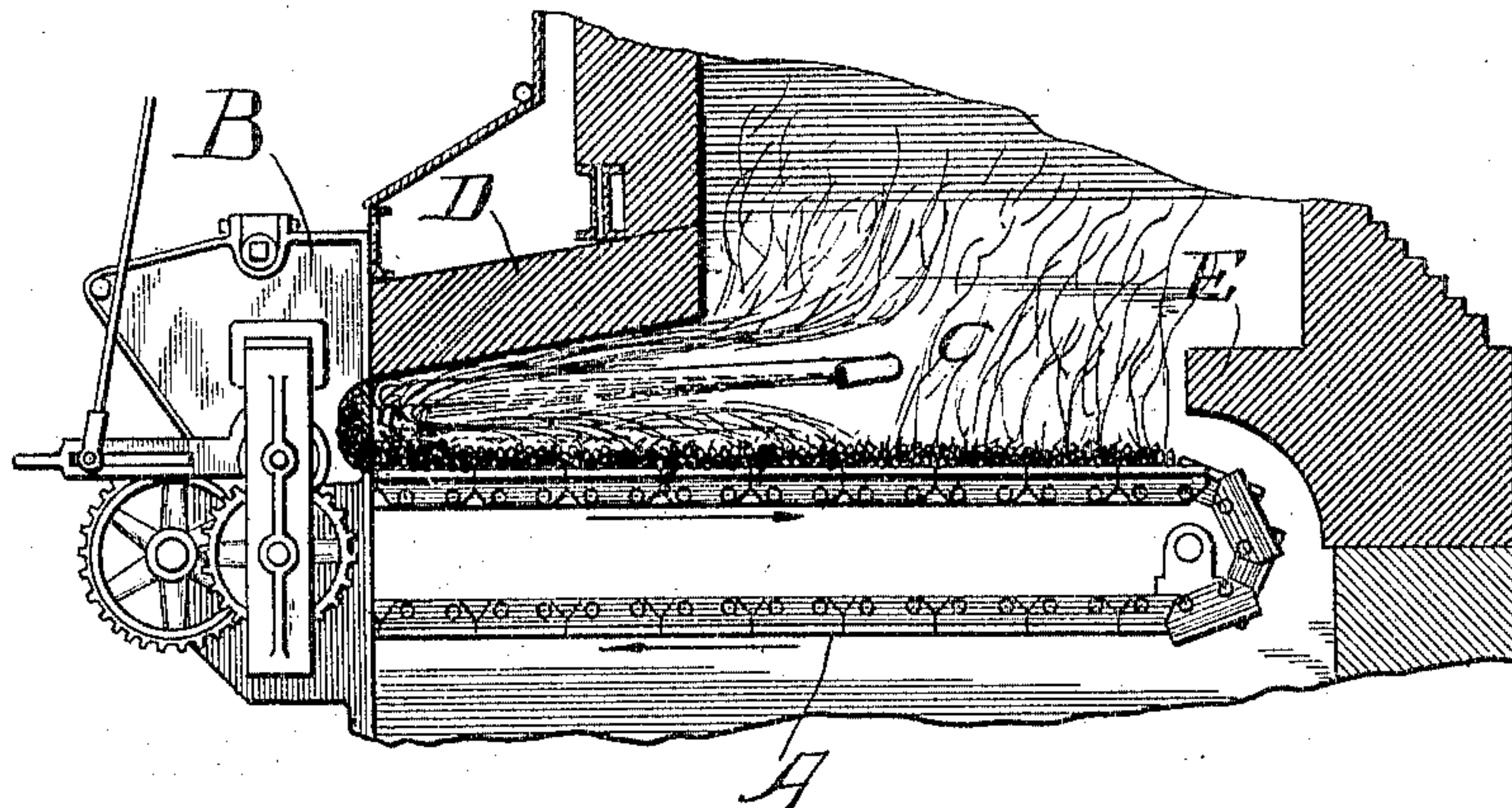
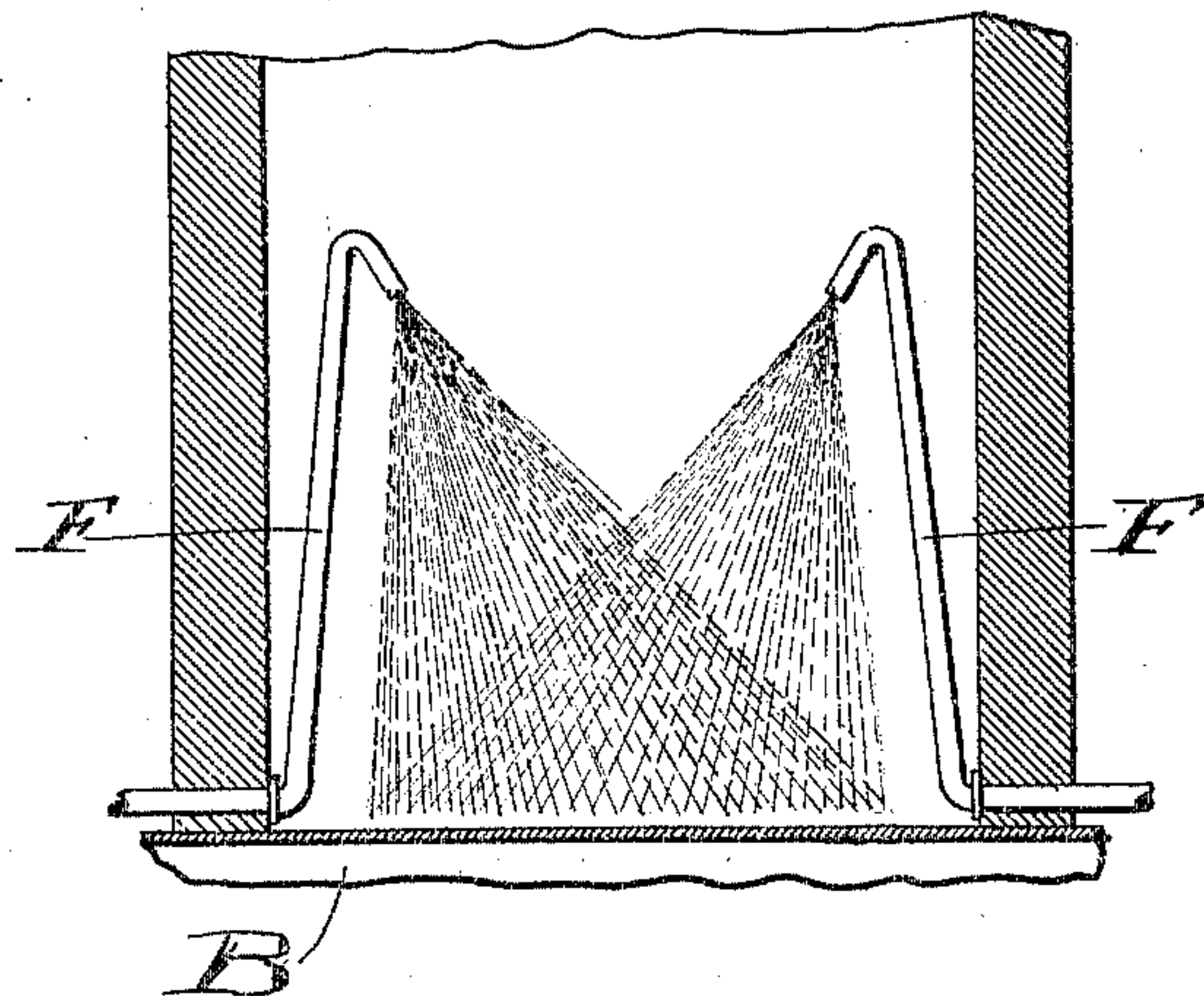


Fig. 2.



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ERLE S. ORMSBY, OF CHICAGO, ILLINOIS.

FURNACE.

SPECIFICATION forming part of Letters Patent No. 776,539, dated December 6, 1904.

Application filed January 8, 1904. Serial No. 188,253. (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
5 invented a certain new and useful Improvement in Furnaces, of which the following is a specification.

In this application I have only claimed the hereinafter-described specific form of my invention, while in application Serial No. 204,008, filed April 20, 1904, I have claimed, broadly, the feature of blowing the flame and heat against the under side of an igniting-arch or against the green coal as it enters the
15 furnace, together with certain additional features not shown and described in this application.

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 a fire-arch is provided and arranged directly over the opening through which the coal is conveyed from the hopper to the combustion-chamber. The said fire-arch is
25 supposed to be maintained at a high temperature—that is to say, at a sufficiently high temperature to cause a practically instantaneous ignition of the coal as soon as it enters the combustion-chamber. As is well known,
30 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 fire-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.
40

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
45 so disposing the same in opposition to the furnace-currents that the heat is concentrated upon the fire-arch, or, in other words, in such manner that the flame and burning gases are forced against the fire-arch, thereby main-

taining the latter at the desired high degree of temperature.

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
55 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 fire-arch D, and the bridge-wall E. These elements of the construction may, it will be readily understood,
65 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
70 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
75 coal is supposed to maintain the fire-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 fire-arch is maintained
80 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
85 words, that the heat of the fire-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. With this provision the flames and burning gases are forced upwardly and
95 directly against the lower surface of the fire-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
 5 of steam, air, or other fluid, is, however, to maintain the fire-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 serves
 10 merely as a means for forcing the flame and burning gases against the lower surface of the fire-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
 15 travel some distance in the combustion-chamber before it ignites.

It will be seen that it is essential that the flame and heat be blown or forced backwardly and upwardly and allowed to then move along
 20 on the under side of the arch toward the rear of the furnace. Also this arch is essentially an igniting-arch.

What I claim as my invention is—

1. A furnace comprising a traveling grate, means for feeding the coal onto the grate, a
 25 fire-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, said means acting from a point or
 30 points wholly outside of the area covered by said arch.

2. A furnace comprising a traveling grate, a hopper for feeding the coal onto the grate,
 35 a fire-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 fire-arch, whereby the latter is maintained at
 40 the proper temperature, said means acting from a point or points wholly outside of the area covered by said arch.

3. A furnace comprising a suitable traveling grate, means for feeding coal onto the
 45 grate, a fire-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
 50 in a direction tending to force the flames and burning gases against the said fire-arch, whereby the latter is maintained at the proper temperature, said means acting from a point or
 55 points wholly outside of the area covered by said arch.

4. In a furnace, the combination of a chain grate, a hopper for feeding the coal onto the grate, a fire-arch extending across the grate
 60 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 fire-arch, where-
 65 by the latter is maintained at the proper temperature, said means acting from a point or points wholly outside of the area covered by said arch.

Signed by me at Chicago, Cook county, Illinois, this 29th day of December, 1903.

ERLE S. ORMSBY.

Witnesses:

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