

No. 730,467.

PATENTED JUNE 9, 1903.

P. MARTIN
LIMEKILN.

APPLICATION FILED NOV. 5, 1902.

NO MODEL.

Fig. 2.

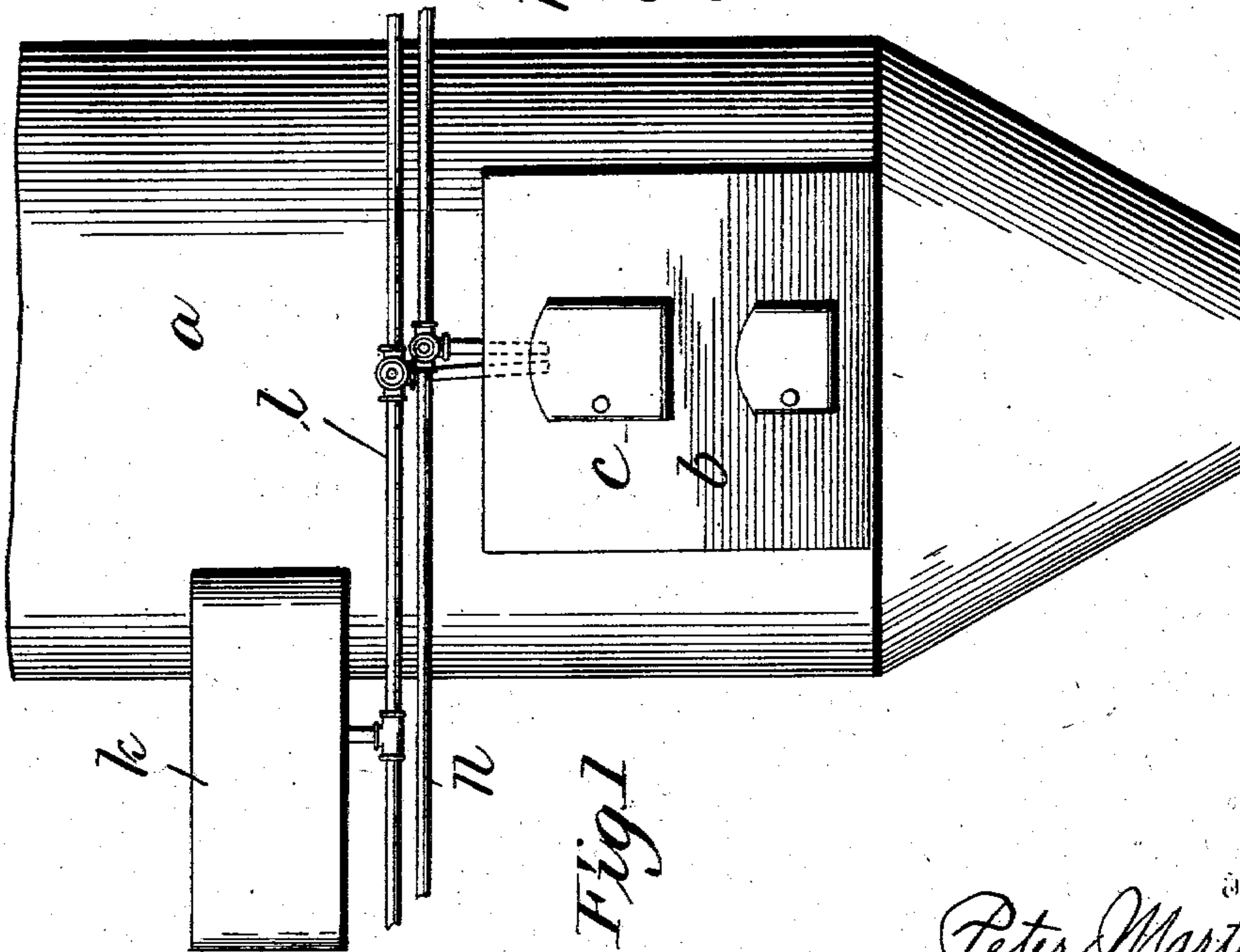
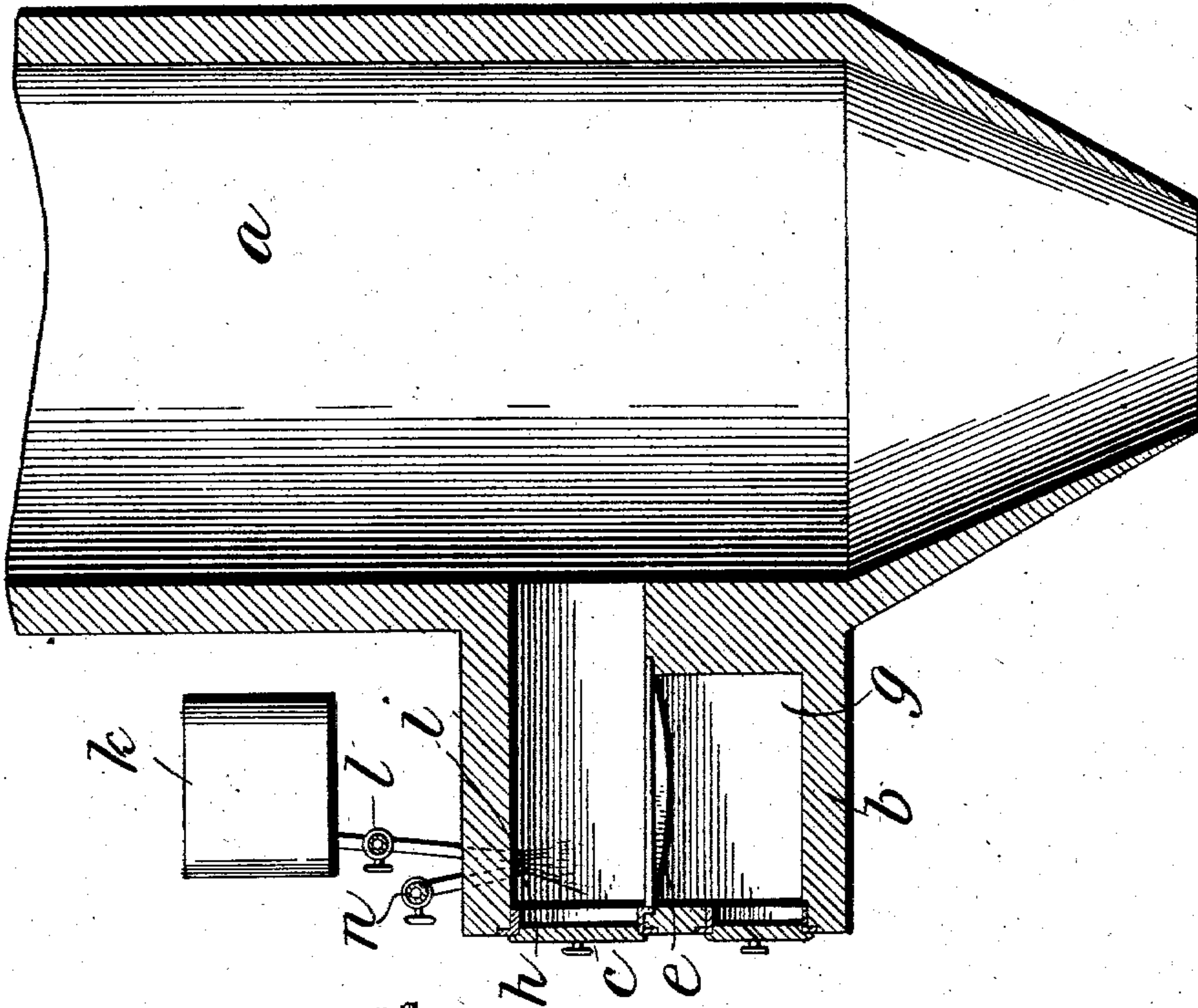


Fig. 1.

Witnesses

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UNITED STATES PATENT OFFICE.

PETER MARTIN, OF HUNTINGTON, INDIANA.

LIMEKILN.

SPECIFICATION forming part of Letters Patent No. 730,467, dated June 9, 1903.

Application filed November 5, 1902. Serial No. 130,142. (No model.)

To all whom it may concern:

Be it known that I, PETER MARTIN, a citizen of the United States, residing at Huntington, in the county of Huntington and State of Indiana, have invented certain new and useful Improvements in Limekilns, of which the following is a specification, reference being had therein to the accompanying drawings.

10 My invention relates to limekilns, and particularly to means designed to be associated with a kiln of ordinary or improved construction for utilizing fuel other than wood as the heat-generating agent; and the same consists
15 in means for supplying moisture to the kiln during the burning operation of the same in such a manner as to improve the product thereof and preserve or protect the kiln itself, whereby the life of the same is increased.

20 To this end the invention includes a steam and water nozzle associated with the furnace of a limekiln with a suitable supply for each, said nozzles being arranged to discharge into the upper part or top of the fire-arch in close
25 proximity to the front thereof or the door of the same, said nozzles being arranged on converging lines, so that the water and steam discharged from the same will intermix before it reaches the fuel upon the fire-grate.

30 The invention further includes the details of construction and combination of parts, as will be hereinafter described, and particularly pointed out in the claim.

35 The invention is illustrated in the accompanying drawings, in which—

Figure 1 shows in side elevation an ordinary type of limekiln with my invention associated therewith. Fig. 2 is a longitudinal sectional view of the same.

40 As shown in the accompanying drawings, the limekiln *a*, of the ordinary type, is indicated as provided with a furnace of ordinary construction, which extends radially from the kiln proper near the bottom of the same.

45 This furnace includes a fire-chamber *b* in open communication at its rear end with the interior of the kiln and normally closed at its front end by a door *c*. In the lower part of the fire-chamber a suitable fuel-supporting grate *e* is arranged, and beneath the
50 latter an ash-pit *g* is located, having a discharge through the front of the furnace.

Associated with the furnace is a steam-nozzle *h* and a water-nozzle *i*, both of which lead into the top of the fire-chamber through the arch of the same near the front end thereof, 55 said nozzles being arranged on converging lines and having their discharge-openings directed toward the grate, so that the steam and water discharged from the same will intermix 60 or intermingle and be directed toward the burning fuel. For supplying water to the nozzle a suitable reservoir *k* is provided, which may be arranged at any convenient point relative to the water-discharge nozzle, which will give 65 the desired static head to discharge the water in a stream from said nozzle, the latter being in communication with the reservoir through a suitable pipe-line *l*. The nozzle *h* is intended to be supplied with steam from any desired 70 source through a suitable pipe-line *n*. For controlling the discharge from the nozzles suitable valves may be associated with the same.

During the operation of the kiln small 75 streams of steam and water are discharged from the nozzles which intermingle with each other, said streams being directed toward the fire burning upon the grate at the bottom of the fire-chamber. This mixture produces a 80 water-gas which serves to produce a more perfect combustion of the fuel, forces the heat generated by the same through the rear end of the fire-chamber into the kiln, thus obtaining the full effect thereof, and it further, by 85 reason of the location of the nozzles which discharge at the upper forward end of the fire-chamber, prevents the flame and heat which is generated approaching the fire-door, and thus the latter is not deleteriously affected by 90 the heat generated within the furnace, and the fire-brick forming the arch of the fire-chamber are likewise protected from said heat and flame by the moisture which is interposed between the same and the fire. Said brick 95 are thus prevented from melting, the latter result frequently occurring in furnaces of the character described not provided with means for maintaining a moist atmosphere between said brick and the fire. A part of the mois- 100 ture introduced into the fire-chamber passes into the kiln and permeates the material being treated, which serves to greatly improve the finished product by preventing overburn-

ing of the same and the formation of a scale or coating impervious to water thereupon, this effect frequently occurring when coal is used as the heat-generating agent, as the lime is in this case often overburned.

A kiln employing coal as the heating agent and provided with my improved apparatus has been found to produce a product in all respects equal to wood-burned lime.

Before drawing a kiln heretofore it has been customary to permit the fire to die down until it is quite low; but with a kiln provided with my apparatus it is simply necessary to turn on a large supply of water or supply larger than that normally employed, which will serve to quickly lower the fire and cool the fire-arch. The excess of water will pass through the grate and into the ash-pit, where the same will be caught. Upon again starting up the fire when the kiln has again been charged the steam rising from the water contained in said pit will serve to prevent the grate-bars from becoming highly heated, and thus preserve the same.

As will be appreciated, the steam and water discharged into the furnace not only serves to increase the fire and improve the product treated, but it further acts to prevent the grate, fire-arch, and fire-chamber door from

becoming overheated or deleteriously affected.

The construction and operation of my invention will be readily understood upon reference to the foregoing description and accompanying drawings, and it will be appreciated that the parts and combinations recited may be varied within a wide range without departing from the spirit of the same.

I claim—

In combination, in a lime kiln having a furnace which includes a fire-chamber, of a water-reservoir, a pipe leading therefrom through the dome of the furnace adjacent to the door of the fire-chamber, said pipe having its discharge-orifice directed toward the grate of the fire-chamber, and a steam-supply pipe also leading through the dome of the furnace adjacent to the door of the fire-chamber with its discharge directed toward said grate and arranged to direct a spray which will intercept the discharge from the first-mentioned pipe.

In testimony whereof I have affixed my signature in presence of two witnesses.

PETER MARTIN.

Witnesses:

LOUIS J. BUCHHEIT,
ULYSSES S. LESH.