

UNITED STATES PATENT OFFICE.

ARTHUR RAMÉN, OF HELSINGBORG, SWEDEN.

METHOD OF WORKING CHANNEL-FURNACES FOR BURNING ORE-BRICKS.

1,058,099.

No Drawing.

Specification of Letters Patent.

Patented Apr. 8, 1913.

Application filed August 4, 1910. Serial No. 575,542.

To all whom it may concern:

Be it known that I, ARTHUR RAMÉN, chief engineer, a subject of Sweden, residing at Villa Margit, Olympia, Helsingborg, Sweden, have invented new and useful Improvements in Methods of Working Channel-Furnaces for Burning Ore-Bricks, &c., of which the following is a specification.

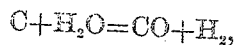
In generators connected to channel furnaces for burning bricks of ore or clay it has hitherto been necessary, if a steam boiler plant has not been available in the neighborhood, to provide a special boiler for producing the necessary steam for operating the generator. It has proved advantageous and in some cases even necessary to operate the generators with air mixed with steam. As a substitute for the boiler it has then been proposed to insert tubular systems containing water in the furnace to be heated by the combustion gases. Such an arrangement, however, becomes rather expensive, and considerable expenses will also be the result, if the steam has to be taken from a special boiler plant.

The present invention has for its object a simple and—as far as the initial cost is concerned—very inexpensive method of operating such a generator.

In most of the cases, the bricks or the like to be burned in channel furnaces contain a certain percentage of water—from about 6% in dressed ore to about 18% in purple ore and 15% in ordinary clay bricks. This water is expelled by the combustion gases in the front part of the furnace, said gases absorbing the water so as to contain a considerable amount of steam, in this respect corresponding to the air supplied to a generator operated in the above-mentioned way. The said combustion gases may therefore be directly drawn out of the front end of the channel by means of a fan or an ejector and employed in feeding the generator with air. Still when containing large quantities of carbonic acid, the said gases may well be employed for the purpose stated, because the carbonic acid then will act in the same way as the steam, i. e., to bind heat and reduce the operating temperature of the generator, so as to produce a porous slag, thoroughly burned, but not molten, and a concentrated

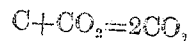
gas. This will be seen by the following reactions:

(1) When steam is used:



i. e. the formation of carbon monoxid and hydrogen from the steam under reduction of temperature.

(2) When carbonic acid is used:



i. e. the formation of carbon monoxid from the carbonic acid (carbon dioxid) under reduction of temperature.

If, however, as is normally the case, the combustion gases contain considerable quantities of carbonic acid and steam, the said gases cannot be used alone. In this case, the said gases are therefore mixed either with hot air from the lower channel serving to cool the trucks of the carriages or the hearth carrying the bricks or with atmospherical air, a suitable mixture being always possible to secure in a simple way by controlling the quantities of gases mixed together. The fact, that the combustion gases as well as the air in the said lower channel are hot, generally about 200° C., and heat quantities thus are led from the furnace, which quantities otherwise may not be well utilized, makes the arrangement still better with respect to economy of heat.

The process can also be used in ring furnaces, which can be considered as a kind of channel furnaces.

Having now particularly described the nature of my invention and the manner of its operation, what I claim is:

1. The herein described method of burning ore bricks and the like which consists in generating gas in a gas producer, burning it in a tunnel furnace containing the moist bricks to be burned, whereby the products of combustion of the gas will mix with the steam formed from the water evaporated from the bricks by the heat, and leading the products of combustion mixed with the steam back to the generator.

2. The herein described method of burning ore bricks and the like which consists in generating gas in a gas producer, burning it in a tunnel furnace containing the

moist bricks to be burned, whereby the products of combustion of the gas will mix with the steam formed from the water evaporated from the bricks by the heat and
5 leading the products of combustion mixed with the steam together with hot air back to the generator.

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

ARTHUR RAMÉN.

Witnesses:

H. TELANDER,
BIRGER NORDFELDT.