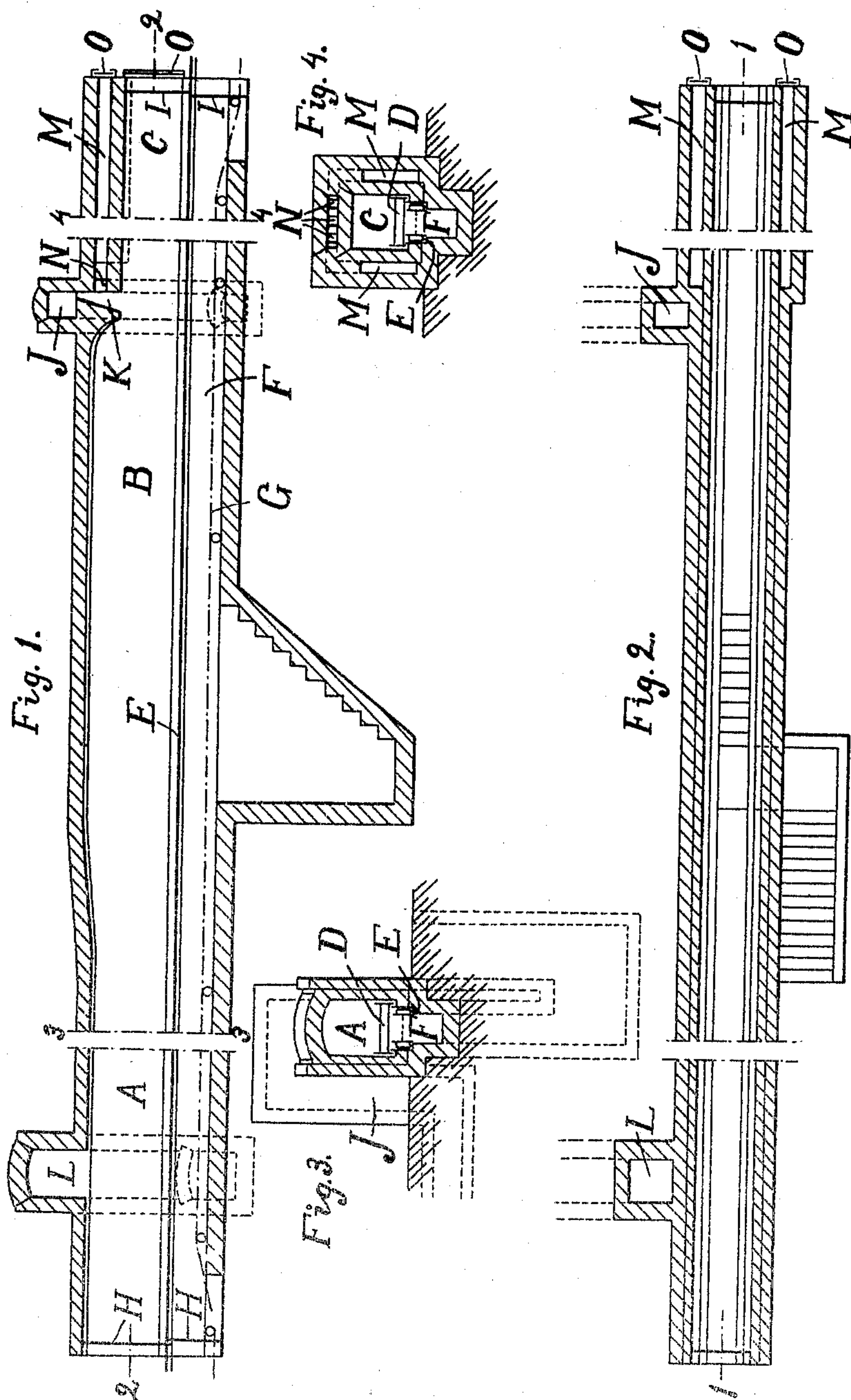


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G. GRÖNDAL.
FURNACE FOR BURNING ORE BRIQUETS.

APPLICATION FILED NOV. 6, 1903.



WITNESSES:
P. W. Wright
Mallin Abbe

INVENTOR
Gustaf Gröndal
BY
Horton and Horton
HIS ATTORNEYS

UNITED STATES PATENT OFFICE.

GUSTAF GRÖNDAL, OF DJURSHOLM, SWEDEN.

FURNACE FOR BURNING ORE BRIQUETS.

SPECIFICATION forming part of Letters Patent No. 780,337, dated January 17, 1905.

Application filed November 6, 1903. Serial No. 180,089.

To all whom it may concern:

Be it known that I, GUSTAF GRÖNDAL, a subject of the King of Sweden and Norway, and a resident of Djursholm, Sweden, have invented a new and useful Improved Furnace for Burning Ore Briquets, (for which I have applied for a patent in Sweden July 21, 1903, No. 1,406, and in Norway July 23, 1903, No. 16,646,) of which the following is a specification.

This invention relates to a furnace of the channel type heated by gas for burning ore briquets carried on trucks, consisting of a preliminary heating-compartment and a cooling-compartment and a burning-chamber of a somewhat greater height situated between these compartments, the furnace differing from furnaces known heretofore for the same purpose in that the walls and roof of the cooling-compartment are provided with channels through which a portion of the air for the combustion is led and that this portion of the air for the combustion is made to issue into the gas-current itself just before it enters the burning-chamber in order to burn the gas better.

In the furnaces known hitherto, in which all the air for the combustion is led into a chamber beneath the trucks, whence it ascends past the trucks at the end of the cooling-chamber and into the latter, an open space must be left between the roof and the piles of briquets on the trucks for the passage of this air, the latter afterward striking against the side of the gas-current entering the burning-chamber. In the furnace described below no such open space is required, so that a greater number of briquets may be loaded on each truck and the piles of briquets may be allowed to extend almost to the roof of the cooling-chamber. The part of the air still passing through the cooling-chamber is thereby compelled to pass between the briquets, and thereby to cool them more effectively, and is heated to a higher temperature than in the former construction of the furnace. By providing channels for the air in the walls and roof of the cooling-chamber the heat that in the hitherto-known furnace radiated through the walls is now absorbed by the air in the channels, and

by leading this preliminary heated air into the gas-current itself before entering the furnace the combustion of the gas is more complete and concentrated. It follows that the temperature in the burning-chamber is increased, and consequently the briquets do not require the same length of time for being fully burned as in the furnaces known hitherto. The trucks, therefore, may be passed through the furnace in a shorter time and the production of the furnace increased.

A further advantage of this invention is that the combustion products escape at a lower temperature and the temperature in the cooling-chamber also rises, whereby the temperature of the air for the combustion in the furnace, as well as in the channels, is still more increased. To allow the combustion products to escape to the chimney without any hindrance, the vault of the compartment for preliminary heating must be placed higher up than that of the cooling-chamber.

In the accompanying drawings there is shown by way of example a form of my furnace.

Figure 1 is a longitudinal section on line 1 1 of Fig. 2, the latter being a horizontal section on line 2 2 of Fig. 1. Figs. 3 and 4 are transverse sections on lines 3 3 and 4 4 of Fig. 1.

A is the compartment for preliminary heating.

B is the burning-chamber, and C the cooling-compartment.

The trucks D, lined with bricks and capable of being coupled to each other, are conveyed through the furnace on the rails E by means of any mechanical device—as, for instance, a chain G, arranged in the chamber F beneath the trucks. The sides of the trucks are provided with plates which project downward into grooves filled with sand in the known manner (see Figs. 3 and 4) in order to shut off the chamber F from the main furnace.

H H and I I are doors at the ends of the furnace.

J is the conduit from the gas-generator, and K is the gas-inlet.

L is the flue to the chimney.

M represents the channels provided in the walls and roof of the cooling-compartment, all

of said channels opening through one or more openings N in the wall of the gas-inlet K.

O represents valves for controlling the supply of air to the channels M. If desired, the
5 air-inlets of those channels may be located in any other place than the one shown. For instance, one or more channels may be carried along a greater or smaller portion of the length of the furnace and connected at the end
10 of the furnace with the channels M, shown in the figures round the cooling-chamber.

The furnace is operated in the same manner as in the furnaces previously known, the only difference being that in this furnace having
15 the compartment for preliminary heating of a greater height than the cooling-compartment each carriage can be charged with a larger number of briquets without interfering with the draft in the furnace, for a free
20 passage is provided over the briquets in the heating-chamber for the flow of the burned gases and in consequence of the air for the combustion being preliminarily heated in the walls and led into the gas-inlet the briquets
25 can be burned in a shorter time than heretofore.

The dimensions may vary according to circumstances; but if the length of the prelimi-

nary heating-compartment and that of the cooling-compartment are respectively about 30 three times the length of the burning-chamber a good result will ensue.

I claim—

A furnace of the channel type for burning by gas-heating ore briquets carried on trucks 35 and consisting of a compartment for preliminary heating, a cooling-compartment and a burning-chamber of a somewhat greater height situated between these compartments, such furnace having channels in the walls and 40 roof for passage of a part of the air for combustion, these channels being connected with each other and with one or more openings in the wall of the inlet of the gas to the burning-chamber the compartment of the furnace for 45 preliminary heating being of greater height than the cooling-compartment, substantially as and for the purpose set forth.

In testimony whereof I have signed my name to this specification in the presence of two sub- 50 scribing witnesses.

GUSTAF GRÖNDAL.

Witnesses:

G. TILLBERG.

M. H. ALLSTROM.