Nov. 23, 1926. O. HEITMANN 1,608,210

TUNNEL OVEN FOR THE COKING OR DISTILLATION OF FUELS

Filed Oct. 28, 1921 2 Sheets-Sheet 1

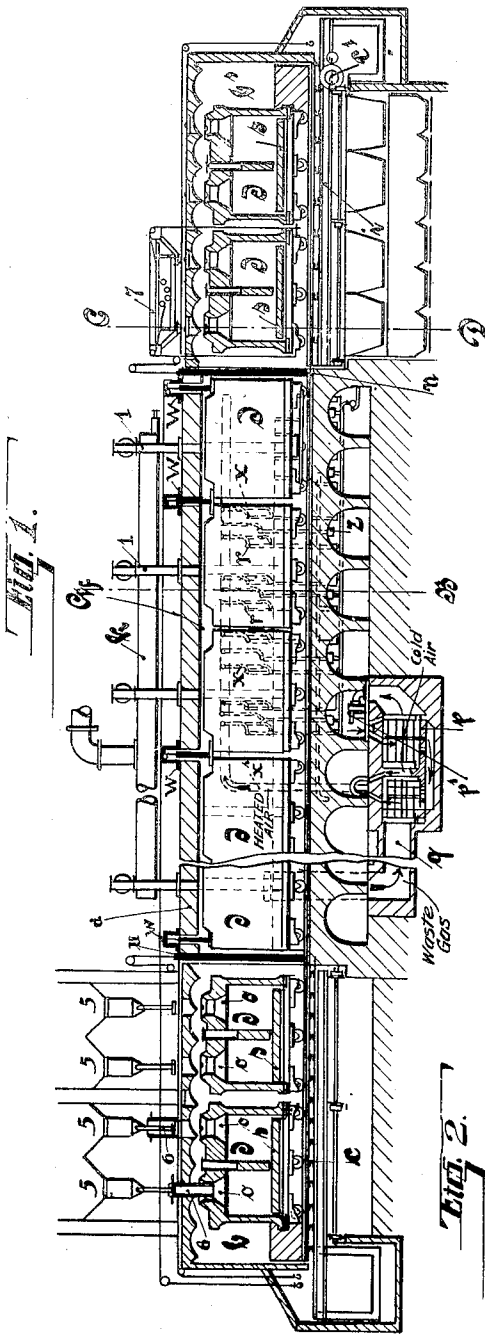


Fig. 1.

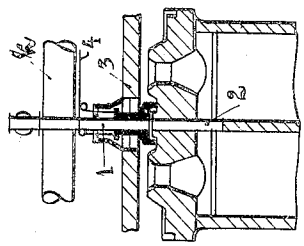


Fig. 4.

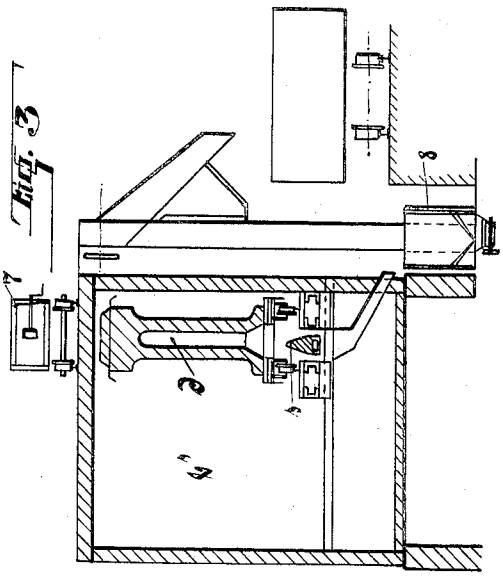


Fig. 3

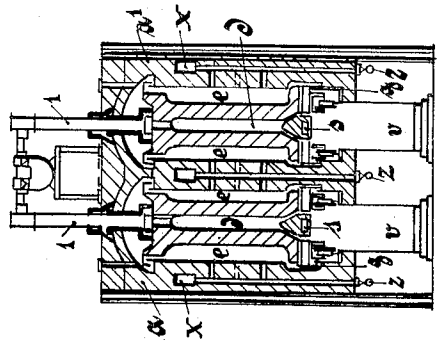


Fig. 2.

Inventor
Otto Heitmann
by Kleinhaeus
Atty.

Nov. 23, 1926. O. HEITMANN 1,608,210

TUNNEL OVEN FOR THE COKING OR DISTILLATION OF FUELS

Filed Oct. 28, 1921 2 Sheets-Sheet 2

Fig. 5.

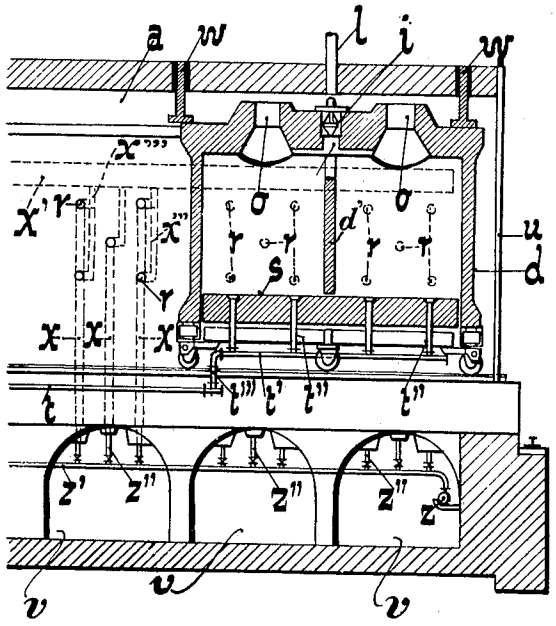
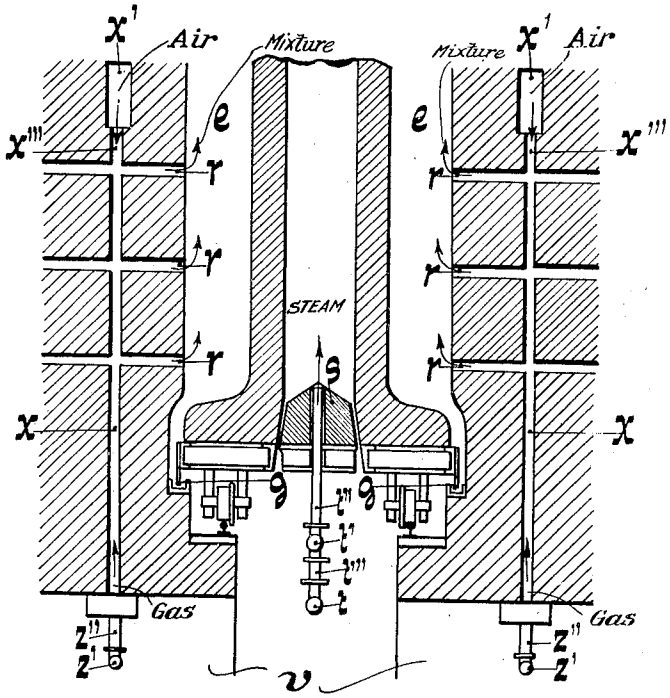


Fig. 6.



Inventor:
Otto Heitmann
by Munn & Co
Attorney.

Patented Nov. 23, 1926. 1,608,210

UNITED STATES PATENT OFFICE.

OTTO HEITMANN, OF LINTFORT, GERMANY.

TUNNEL OVEN FOR THE COKING OR DISTILLATION OF FUELS.

Application filed October 28, 1921, Serial No. 511,228, and in Germany February 28, 1921.

My invention relates to tunnel ovens for the continuous coking or distillation of bituminous fuels and more particularly to that type of ovens in which the fuel is contained in retorts mounted on trucks travelling through heating flues extending within the oven, the retorts being directly acted upon by the hot gases.

In my oven, these truck retorts are arranged to form with the tunnel walls a closed heating chamber, or rather two heating chambers, one on each side of the truck retort between the wall of the retort and the adjacent wall of the tunnel, the chamber or chambers being out of direct communication with the atmosphere and with the interior of the retorts.

It is an object of my invention to provide improved means in an oven of this type for supplying a fluid, for instance gas or combustion air to the heating chamber or chambers. To this end I provide an inspection tunnel below each heating tunnel and arrange the controls of the supplying means in these inspection tunnels. With this arrangement the gas or air supplying means can be adjusted at any time during the operation of the oven so that its operation can be regulated with great exactitude.

Regenerators or recuperators may be combined with this oven for preheating the air for combustion. The gas may also be preheated if desired or necessary, for instance, if poor gas is employed.

It is another object of my invention to provide improved means for connecting the truck retorts with a gas discharge header. To this end I provide movable extensions, so-called bells, on the ends of the branch pipes from the header to the retorts, these bells being adapted to be lowered onto the retorts. By this simple expedient each retort has its own connection with the header, the pyrogenous constituents of the products are thus obtained at a minimum loss, and the products of distillation are withdrawn from the retorts without interfering with the truck retorts moving through the oven.

In the drawings affixed to this specification and forming part thereof an oven embodying my invention is illustrated diagrammatically by way of example.

In the drawings,

Fig. 1 is a longitudinal section of one of the tunnels of an oven according to my invention which comprises two parallel tunnels, and of the forebays connected with these tunnels in which the trucks for the retorts are shunted.

Fig. 2 is a section of the oven on the line G—H and

Fig. 3 is a section of the rear end forebay on the line I—K in Fig. 1,

Fig. 4 is a longitudinal section similar to Fig. 1, but drawn to a larger scale, illustrating one of the bells for connecting the truck retorts with the header for the discharge of the distillation products,

Fig. 5 is a longitudinal section similar to Fig. 1, but drawn to a larger scale, showing one of the truck retorts and the means for supplying fluid to its heating chambers and to the interior of the retort, and

Fig. 6 is another section on the line G—H of Fig. 1 showing the base portion of a retort and its heating chambers drawn to a larger scale than in Fig. 2.

Referring now to the drawings, a and a' are the two parallel tunnels of the oven in which the retort trucks d are moved on tracks in the usual manner. b and b' are forebays at the ends of the oven in which travelling platforms c and i are provided for shunting the trucks onto the tracks in the tunnels a and a'. The trucks are charged in the front end forebay b and are emptied in the forebay b'. g and g' are packing strips at the upper and lower ends of said truck retorts. These strips project into troughs which may be filled with sand or other refractory material. In this manner heating chambers e are formed on each side of the retorts between them and the adjacent tunnel walls, such chambers being closed at the top and bottom by the strips g, g' so that they are out of direct communication with the atmosphere and with the interior of said retorts. Inspection tunnels v are arranged below and in parallel to each tunnel and are connected with arched transverse outlets (Figs. 1 and 5)

A heating gas header z is arranged at the end of the oven, as shown in Fig. 5, and gas mains z' extend from such header along each inspection passage v. Branch pipes z'' are connected to the mains and to gas passages x in the walls of the oven. In the present instance the heating chambers e are provided with six passages x for each truck retort d. Burners r connected to the passages x open into the heating chambers e (Fig. 6). Air for combustion is supplied

to the passages x through horizontal passages x' with which are connected extensions x''' of the gas passages x. The control members for the gas pipes such as cocks or valves, are arranged in the inspection passages so as to be readily accessible from these passages and the supply of combustion air to the passages x' can also be regulated by suitable controlling means in the passages, such means not being shown in the drawings in order to avoid confusion but being obvious to any expert without further explanation. Instead of providing a main passage x for the heating gas from which branches e extend to the heating chambers, a separate passage may be connected to each passage r and may be provided with separate controlling means.

Air for combustion is submitted through passages q' in the floors of the inspection passages v and into a recuperator p arranged below the inspection passages v; control members (not shown) may be provided in the passages for regulating the flow of air through the passages. Obviously, a regenerator may be provided instead of a recuperator. The air for combustion is heated and conducted to the passages x' through passages x'' which are connected with the air chambers of the recuperator p. A fan pt is provided for drawing the products of combustion from the heating chambers e. A passage q is connected with the heating chambers e by means of horizontal passages and ports at the base portions of the chambers so that the products of combustion are withdrawn simultaneously from all the chambers and are discharged into a stack (not shown) by the fan pt.

The air for combustion, instead of being heated in the recuperator p as described, may also be supplied directly to the heating chambers e from the inspection passages v

When the oven is operated with poor gas, the gas is heated in a similar manner as described for the combustion air.

As shown in Fig. 5, each truck retort d is subdivided into two chambers by a partition d'. These chambers are connected by a port 2 above the partition. Each retort is provided with a charging opening o which may be closed by a suitable valve (not shown). The distillates from the retort chambers are conducted to a header k through vertical branch pipes l with extensions comprising bells 3 which are adapted to be displaced axially on the branch pipes l and to be lowered down onto the common discharge ports 2 above the partitions d'. The discharge ports 2 are provided with valves i for closing them when the bell 3 is not in operation. All the bells of an oven are interconnected by cables 4 so that they may be raised and lowered in unison when the retort trucks d are displaced. Movable partitions w may be provided above each retort so as to divide the top part of the tunnel into a plurality of chambers, one for each retort. However, as the retorts are connected directly with the header k, such partitions are not strictly required and may also be dispensed with.

The charging of the retorts is effected by means of hoppers 5 at the top of the front end forebay b and pipes 6 connected with these hoppers are adapted to be lowered into the openings o of the retorts. When the retort trucks arrive at the rear end forebay b', their bottoms s are lowered by means of a travelling crane 7 from which the bottoms s are suspended by cables 7'. The bottoms s are secured in the retorts by bolts j. Instead of a travelling crane, as illustrated, means for handling the bottoms s may be arranged on the travelling platform i. The residue from the retorts is taken up by chutes 8' and conducted to trays 8 or the like.

In order to enable the oven to be operated as a gas producer I may provide a pipe line t in the inspection passage v below and between the tracks. In the tunnels corresponding pipe lines t' are secured below the bottoms s of the retorts and connected to the retorts by branch pipes t''. A detachable connection t''' is inserted between the pipe lines t and t', and valves (not shown) are provided for regulating the supply of fluid to the retorts. Steam, air or other fluids may be alternately introduced or blown into the retorts.

I wish it to be understood that I do not desire to be limited to the exact details of construction shown and described, for obvious modifications will occur to a person skilled in the art.

I claim:

1. A tunnel oven comprising a tunnel, truck retorts adapted to be moved through said tunnel and to form with the tunnel wall a closed heating chamber between them and the tunnel wall, said chamber being out of direct communication with the atmosphere and with the interior of said retorts, an inspection tunnel below said retort tunnel, means for supplying fluid to said heating chamber, and means in said inspection tunnel for controlling said supplying means.

2. A tunnel oven comprising a tunnel, truck retorts adapted to be moved through said tunnel and to form with the tunnel wall a closed heating chamber between them and the tunnel wall, said chamber being out of direct communication with the atmosphere and with the interior of said retorts, an inspection tunnel below said retort tunnel, means for supplying fluid to said heating chamber, means in said inspection tunnel for controlling said supplying means, and means for heating such fluid with the waste heat from the oven.

3. A tunnel oven comprising a tunnel, truck retorts adapted to be moved through said tunnel and to form with the tunnel wall a closed heating chamber between them and the tunnel wall, said chamber being out of direct communication with the atmosphere and with the interior of said retorts, an inspection tunnel below said retort tunnel, burners in said heating chamber, and means in said inspection tunnel for controlling the fluid supply to said burners.

4. A tunnel oven comprising a tunnel, truck retorts adapted to be moved through said tunnel and to form with the tunnel wall a closed heating chamber between them and the tunnel wall, said chamber being out of direct communication with the atmosphere and with the interior of said retorts, a header for removing gas from said retorts, branch pipes connected with said header, an extension adapted to be displaced on each branch pipe so as to be lowered onto said retorts, means on said extension for making a tight connection with said retorts, an inspection tunnel below said retort tunnel, means for supplying fluid to said heating chamber, and means in said inspection tunnel for controlling said supplying means.

In testimony whereof I affix my signature.

OTTO HEITMANN