No. 785,689. PATENTED MAR. 21, 1905.

C. WEGENER.

SMOKELESS COMBUSTION FURNACE.

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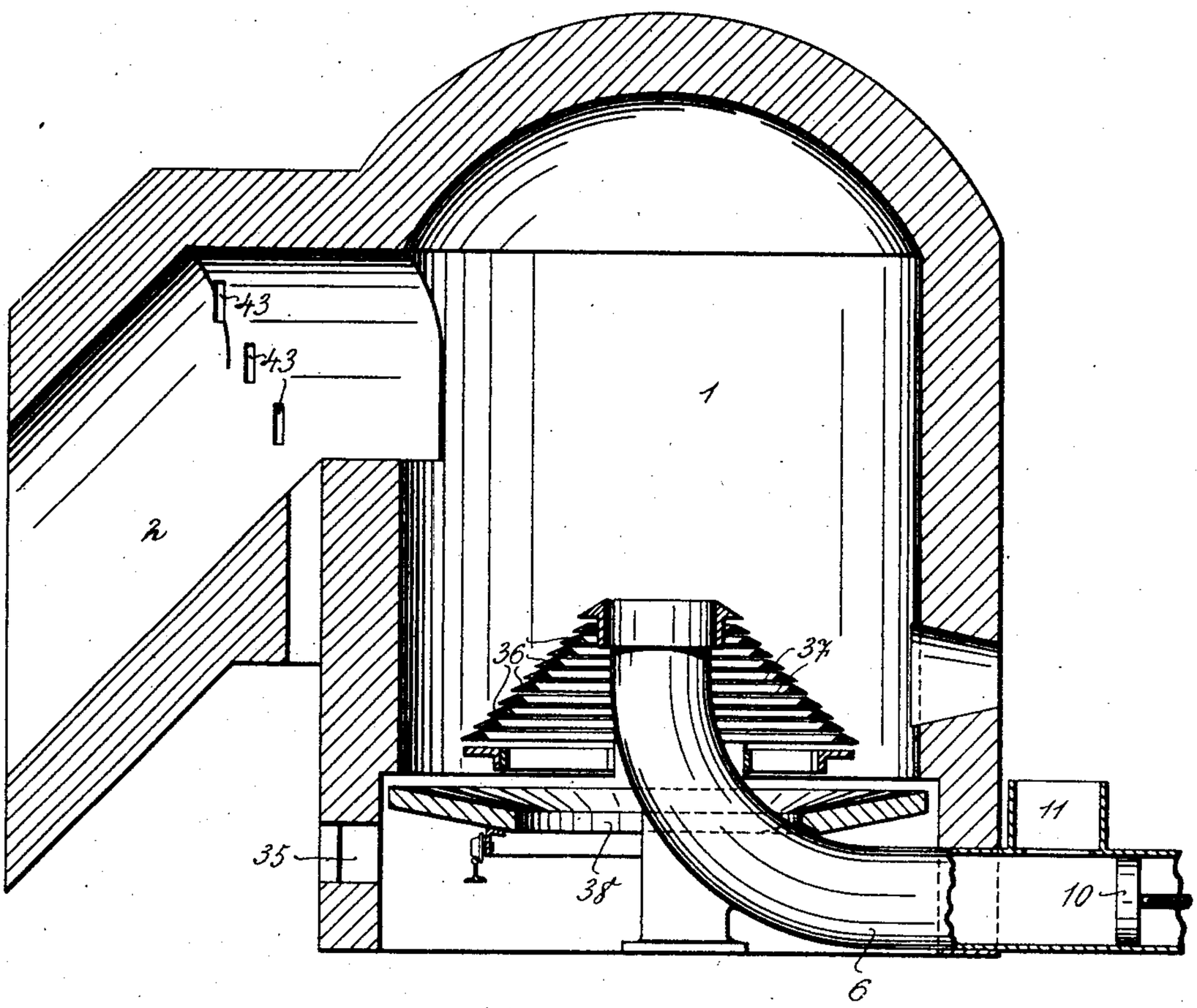

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No. 785,689. Patented March 21, 1905.

UNITED STATES PATENT OFFICE.

CARL WEGENER, OF BERLIN, GERMANY.

SMOKELESS COMBUSTION-FURNACE.

SPECIFICATION forming part of Letters Patent No. 785,689, dated March 21, 1905.

Original application filed October 17, 1900, Serial No. 33,389. Divided and this application filed October 30, 1902. Serial No. 129,358.

To all whom it may concern:

Be it known that I, CARL WEGENER, a subject of the King of Prussia, Emperor of Germany, residing at No. 14 Gitschinerstrasse, Berlin, Prussia, German Empire, have invented new and useful Improvements in and in Connection with Smokeless Combustion-Furnaces, of which the following is a specification.

My invention relates to improvements in and connected with that class of furnaces in which the fresh fuel is fed in known manner from underneath below the layer of live fuel.

The invention consists more especially in the arrangement of the furnace in such manner that the sole of the combustion-chamber is formed by a fireproof step-grate placed upon the feed-pipe, the said grate consisting of a number of separate rings with a removable disk arranged underneath the same.

In the accompanying drawing I have shown in vertical section a smokeless combustion-furnace constructed according to my invention.

The furnace consists of the combustion-chamber 1, which may have any optional dimensions. The sole of the combustion-chamber is formed by a fireproof step-grate 37, consisting of a number of separate rings 36 and mounted on the pipe 6 for feeding the fuel into the combustion-chamber, and by an annular plate 38, movable, for instance, on rollers. The flue 2 for drawing off the generated fire-gases is in this construction at the top and laterally arranged. For the purpose of conducting away the clinker and ash the annular plate 38 preferably slopes downwardly toward its outer edge and is kept in continuous motion by means of any suitable device. Openings 43 may be also provided in the wall of the flue 2 for the purpose of introducing air into this channel and to convert the oxid of carbon into carbonic acid.

In this system of firing the draft from the chimney, as also the supply of air which is introduced through a door 35 under the grate and which passes through the spaces between the rings of the grate, is sufficient to maintain the combustion.

The above-described furnace is operated as follows: The fuel is from the hopper 11 introduced into the combustion-chamber 1 from below by means of any suitable feed device—for instance, by the piston 10—through the feed-pipe 6 in such manner that a small heap of fuel is formed, which heap is then lighted. The quantities of coal then introduced into the combustion-chamber come to lie below the burning fire layer, so that the grating-gases here generated ascend through the glowing coal, become heated to the combustion temperature, and then mix with the combustion-air introduced from underneath through the spaces between the separate rings 36.

In a combustion-furnace constructed according to the present invention the fuel introduced is heated to such a degree by the burning coal above the same that the products of distillation upon passing the burning layers become completely consumed, whereby a complete and smokeless combustion of the coal is attained and a simultaneous and almost complete utilization of the theoretical calorific value of the fuel hitherto practically impossible.

This application is a division of my application filed October 17, 1900, Serial No. 33,389.

What I claim as my invention is—

1. In a smokeless combustion-furnace in which the fresh fuel is fed from underneath below the layer of live fuel, the combination with a combustion-chamber, of a pipe opening upward to the combustion-chamber for introducing the fuel into the said chamber, a conical step-grate consisting of a number of rings and arranged about the feed-pipe, a movable annular plate arranged beneath and extending beyond the conical step-grate, the grate and said annular plate forming the sole of the combustion-chamber, a flue for drawing off the combustion-gases, and means for forcing the fuel through the said feed-pipe, substantially as described.

2. In a smokeless combustion-furnace in which the fresh fuel is fed from underneath below the layer of live fuel, the combination with a combustion-chamber, of a pipe opening upward to the combustion-chamber for introducing the fuel into the said chamber, a conical step-grate consisting of a number of rings and arranged about the feed-pipe, a

movable annular plate arranged beneath and extending beyond the conical step-grate, the grate and said annular plate forming the sole of the combustion-chamber, a flue for drawing off the combustion-gases, openings in the said flue, and means for forcing the fuel through the said feed-pipe, substantially as described.

3. In a smokeless combustion-furnace in which the fresh fuel is fed from underneath below the layer of live fuel, the combination with a combustion-chamber, of a pipe opening upward to the combustion-chamber for introducing the fuel into said chamber, a conical step-grate consisting of a number of rings and arranged about the feed-pipe, a movable annular plate arranged beneath and extending beyond the conical step-grate, said plate sloping downwardly toward its outer edge, and said plate and the conical grate forming the sole of the combustion-chamber, a flue for drawing off the combustion-gases, and means for forcing the fuel through the feed-pipe, substantially as described.

4. In a smokeless combustion-furnace in which the fresh fuel is fed from underneath below the layer of live fuel, the combination with a combustion-chamber, of a pipe opening upward to the combustion-chamber for introducing the fuel into said chamber, a conical step-grate consisting of a number of rings and arranged about the feed-pipe, a movable annular plate arranged beneath and extending beyond the conical step-grate, the grate and said annular plate forming the sole of the combustion-chamber, a flue for drawing off the combustion-gases, means for forcing the fuel through said feed-pipe, and means for moving said annular plate continuously for conducting away the clinkers and ashes, substantially as described.

In testimony whereof I have hereunto set my hand in presence of two subscribing witnesses.

CARL WEGENER.

Witnesses:
WOLDEMAR HAUPT,
HENRY HASPER.