

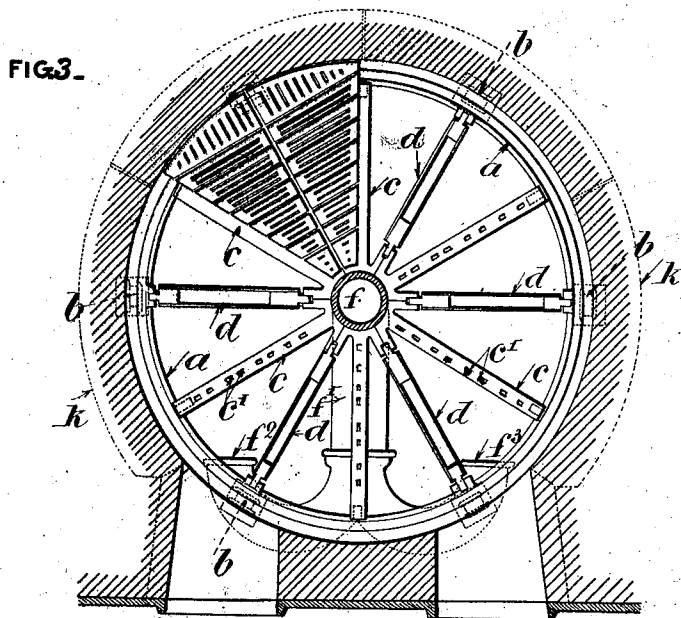
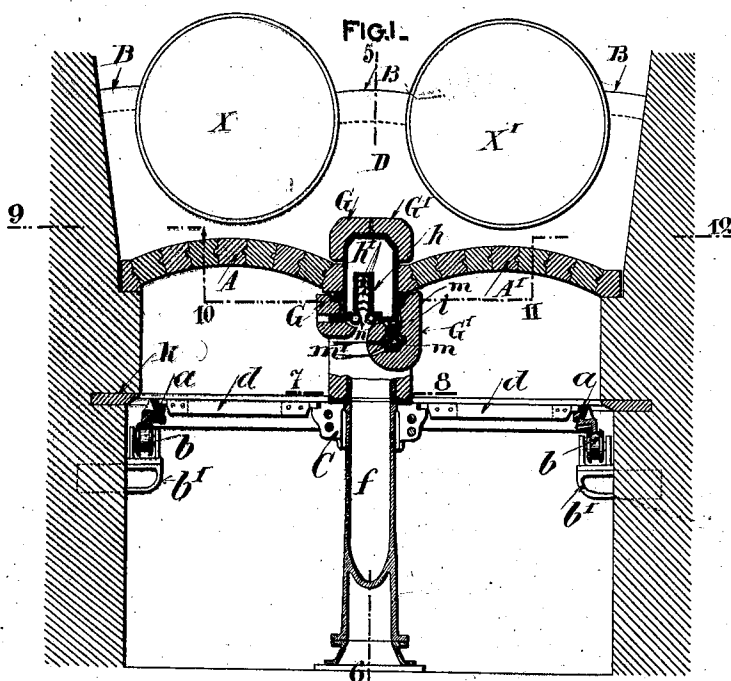
No Model.)

4 Sheets—Sheet 1.

C. GROLL.  
SELF FEEDING SMOKE CONSUMING FURNACE.

No. 578,146.

Patented Mar. 2, 1897.



WITNESSES.

Edward G. Driscoll  
Charles Groll

INVENTOR:

Charles Groll

(No Model.)

4 Sheets—Sheet 2.

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FIG. 2.

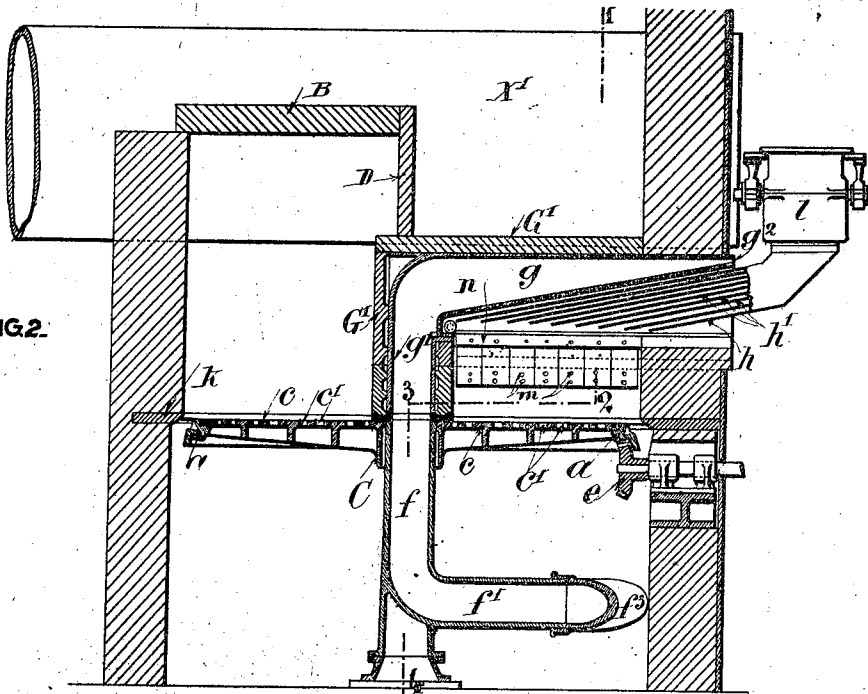
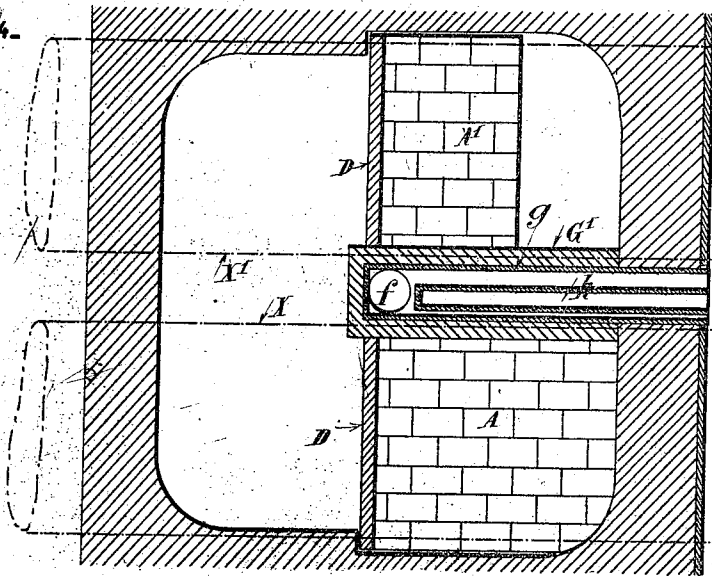


FIG. 4.



WITNESSES.

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4 Sheets—Sheet 3.

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FIG. 6.

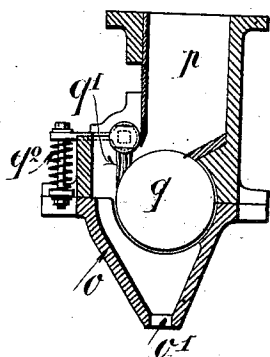


FIG. 5.

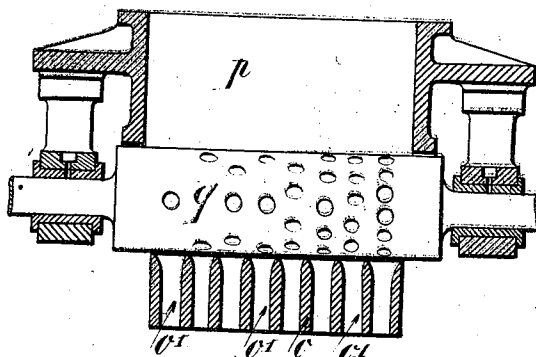


FIG. 7.

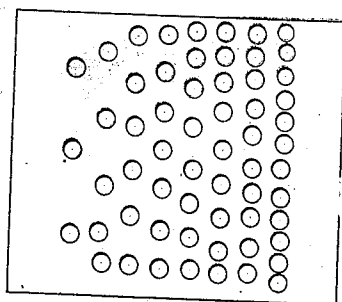
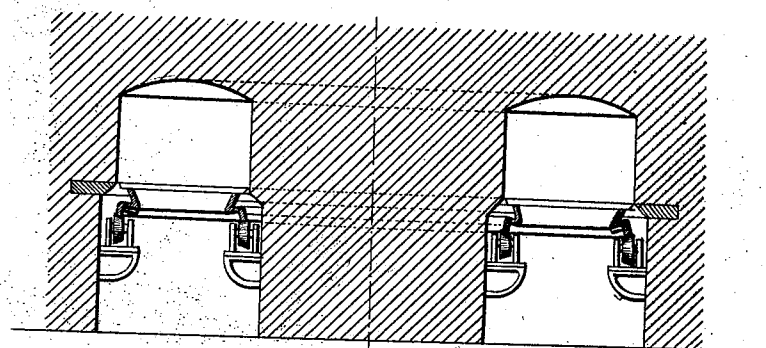


FIG. 12.



WITNESSES.

Edward A. Bramwell

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INVENTOR:

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(No Model.)

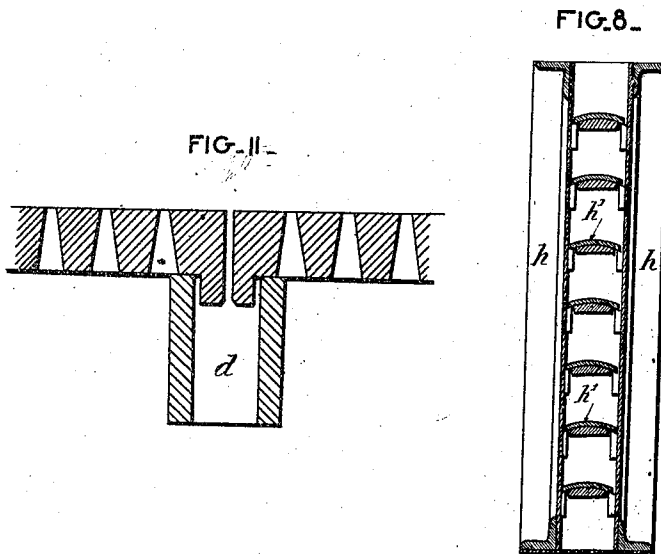
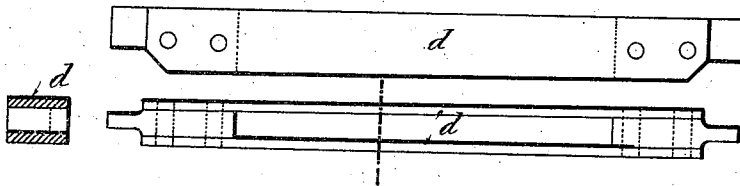
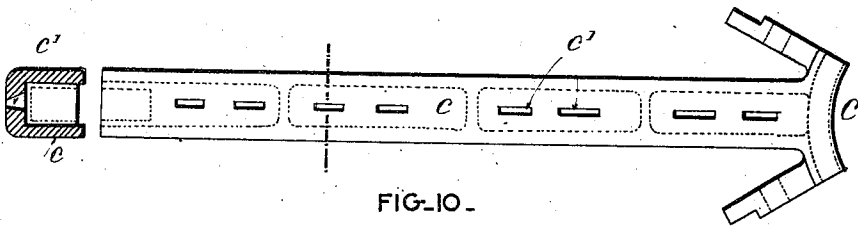
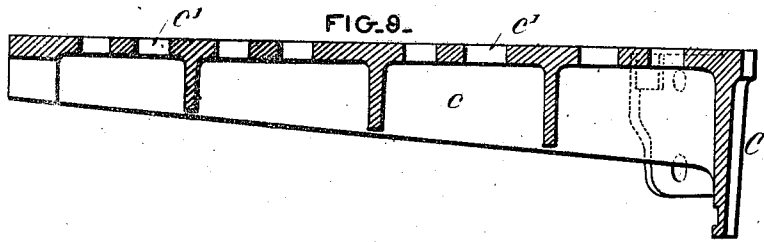
4 Sheets—Sheet 4.

C. GROLL.

SELF FEEDING SMOKE CONSUMING FURNACE.

No. 578,146.

Patented Mar. 2, 1897.



WITNESSES.

Edward A. Brewster

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INVENTOR:

Charles Groll

# UNITED STATES PATENT OFFICE.

CHARLES GROLL, OF ROUBAIX, FRANCE.

## SELF-FEEDING SMOKE-CONSUMING FURNACE.

SPECIFICATION forming part of Letters Patent No. 578,146, dated March 2, 1897.  
Application filed October 21, 1896. Serial No. 609,499. (No model.) Patented in France May 30, 1896, No. 256,699.

To all whom it may concern:

Be it known that I, CHARLES GROLL, engineer, of Roubaix, Department du Nord, in the Republic of France, have invented a new and Improved Rotatory Grate and Self-Feeding Smoke-Consuming Furnace, (for which I have obtained Letters Patent of France for fifteen years, dated May 30, 1896, No. 256,699;) and I do hereby declare that the following is a full and exact description thereof, reference being made to the accompanying drawings.

In all rectangular or round grate-furnaces the gases evolved are carried away behind the bridge-wall before having been consumed, and consequently the yield of heat given by the fuel has been heretofore small when compared with that which might in theory be produced.

A great many devices have been proposed to do away with smoke, which is injurious both from an economic and a hygienic point of view; but in general the utility of such devices depends on proper care on the part of the stoker, since, notwithstanding the changes or additions made, the usual systems of grates are retained, some of which are fixed and others movable in their constitutive parts, but all belong to one or other system, the general economy of which has remained the same as in the past.

My invention has for its object to get all the smoke consumed by rendering the combustion methodical—that is to say, first, by getting the fresh coal always to come onto coal which is incandescent; secondly, by increasing the length of the course followed by the gases produced in the combustion-chamber and by keeping them there as much as possible, and, thirdly, by conducting the said gases successively from the relatively coolest to the hottest portion of the fuel.

In order to insure the desired result, my invention consists, essentially, in the hereinafter particular arrangement of a rotatory grate, automatically, the coal raising mechanism, and the construction of the grate.

The accompanying drawings clearly show the distinguishing characters of my invention and which I desire to secure by Letters Patent.

In the drawings, Figure 1 is a vertical cross section of a steam-generating furnace embodying my invention, the section being made on the broken line 1 2 3 4 of Fig. 2. Fig. 1—that is to say, in the longitudinal axis of the furnace. Fig. 3 is a plan of the rotatory grate, the greater part of the bars being moved, the section of the furnace being on the line 7 8 of Fig. 1. Fig. 4 is a vertical section on the broken line 9 10 of Fig. 1. Figs. 5 and 6 are detail views of an automatic coal-feeder, Fig. 5 being made in the longitudinal axis of the cylinder and Fig. 6 being a vertical section. Fig. 7 shows the feeder-veloped. Fig. 8 is a cross-section of the channel which conducts the grate. Figs. 9, 10, and 11 are the supporting-arms of the grate. Fig. 12 shows a modification to be applied to a generating furnace.

The grate-support comprises a, moving on six rollers b are mounted in support of the ash-pit. A movable longitudinally not to offer any resistance or the contraction of is in two parts to move into position. Six radial arms and rest at their ends. Six said ends. Six rest at their ends. Six the hub C are lar lugs of the substitute the are of special length to variable of the co are shown Figs. 9 and 10.



sumption of the smoke, because they are more and more completely come into contact with coal and more incandescent, all moving in the same direction.

My invention of a rotative automatic coal-feeder is applicable to usual constructions of generating

I reserve to myself the right of making at will the lower diameter of the furnace in order to transform the ordinary furnace into a furnace having it of a ring in which the rotative grate, and to which may be adapted a rotative automatic coal-feeding device, so as to make a smoke-consuming furnace similar to the one hereinbefore described, with the difference, that the central portion would be omitted entirely, as will be seen from the cross-section represented.

Having now ascertained the nature of the said invention and in what manner it is to be performed, I declare my claim is—

1. A furnace, provided with a grate, arranged in the combustion-chamber, the floor or ceiling forming a passage leading forwardly from one half of the grate, the other half of the grate, and a vault forming a passage leading backwardly from the other half of the grate, and a channel connecting the rear passages, the forwardly-leading passage being connected to the chimney at substantially as described.

2. A furnace, provided with a grate, arranged in the combustion-chamber, the floor or ceiling forming a passage leading forwardly from one half of the grate, the other half of the grate, and a vault forming a passage leading backwardly from the other half of the grate, and a channel connecting said passage to the rear ends of said vault, and a vertical wall, the forwardly-leading passage being connected to the chimney at the rear end, substantially as described.

3. In a smoke-consuming furnace, a coal-feed mounted to turn, a coal-feed grate, a radial chamber, placed around the coal-feeder and connected, at the grate, with the standard around which said grate revolves, in order that the fresh air coming from the said chamber may become heating toward the central standard grate, then be driven out by the help of the air-jets issuing from the