(No Model.)

L. C. THIELE.

COMBINED GAS BURNER AND GRATE BAR.

No. 565,050. Patented Aug. 4, 1896.

Fig. 1.

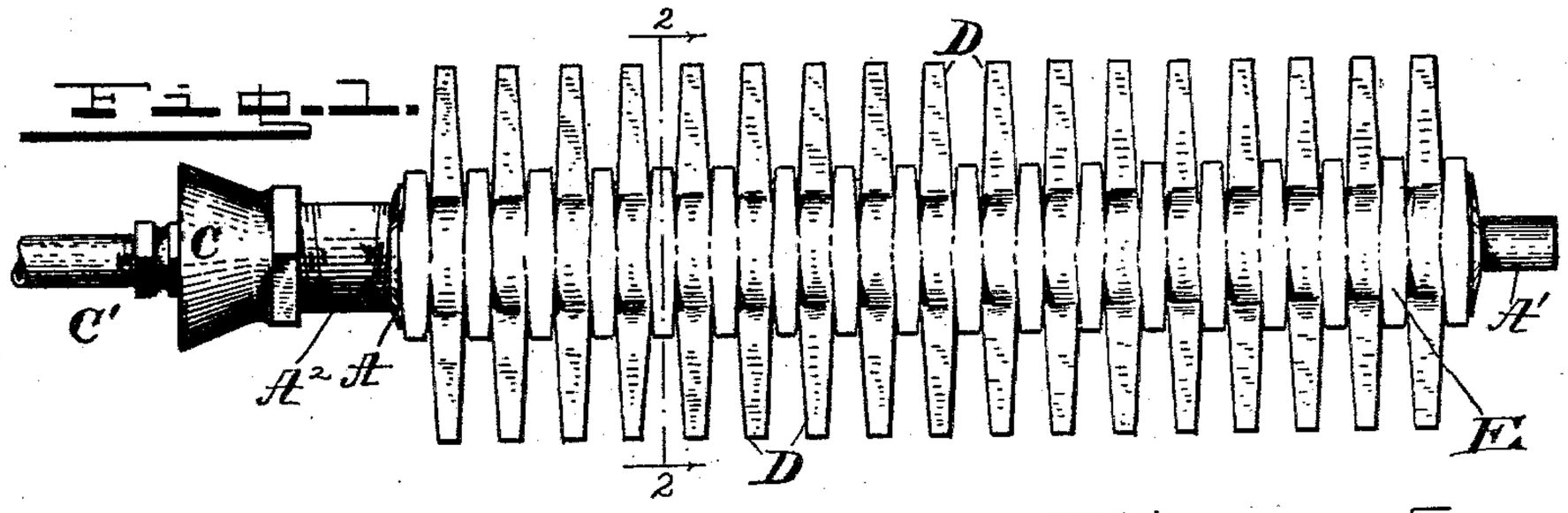


Fig. 2.

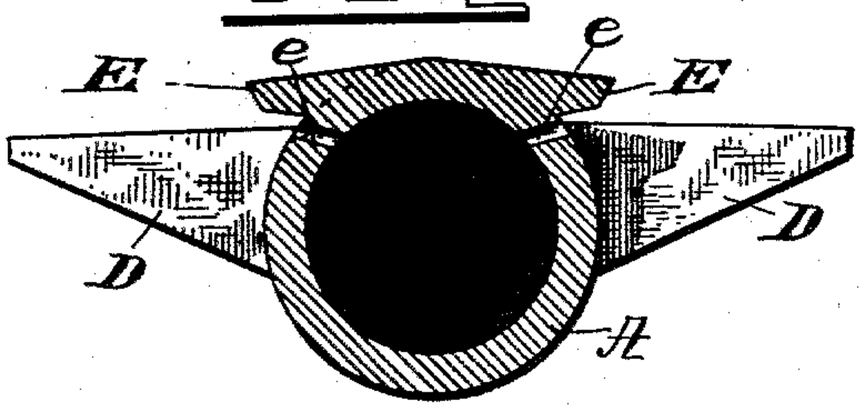


Fig. 5.

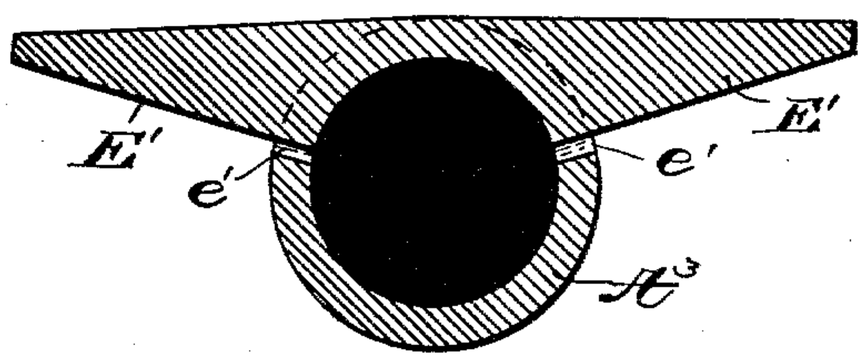


Fig. 3.

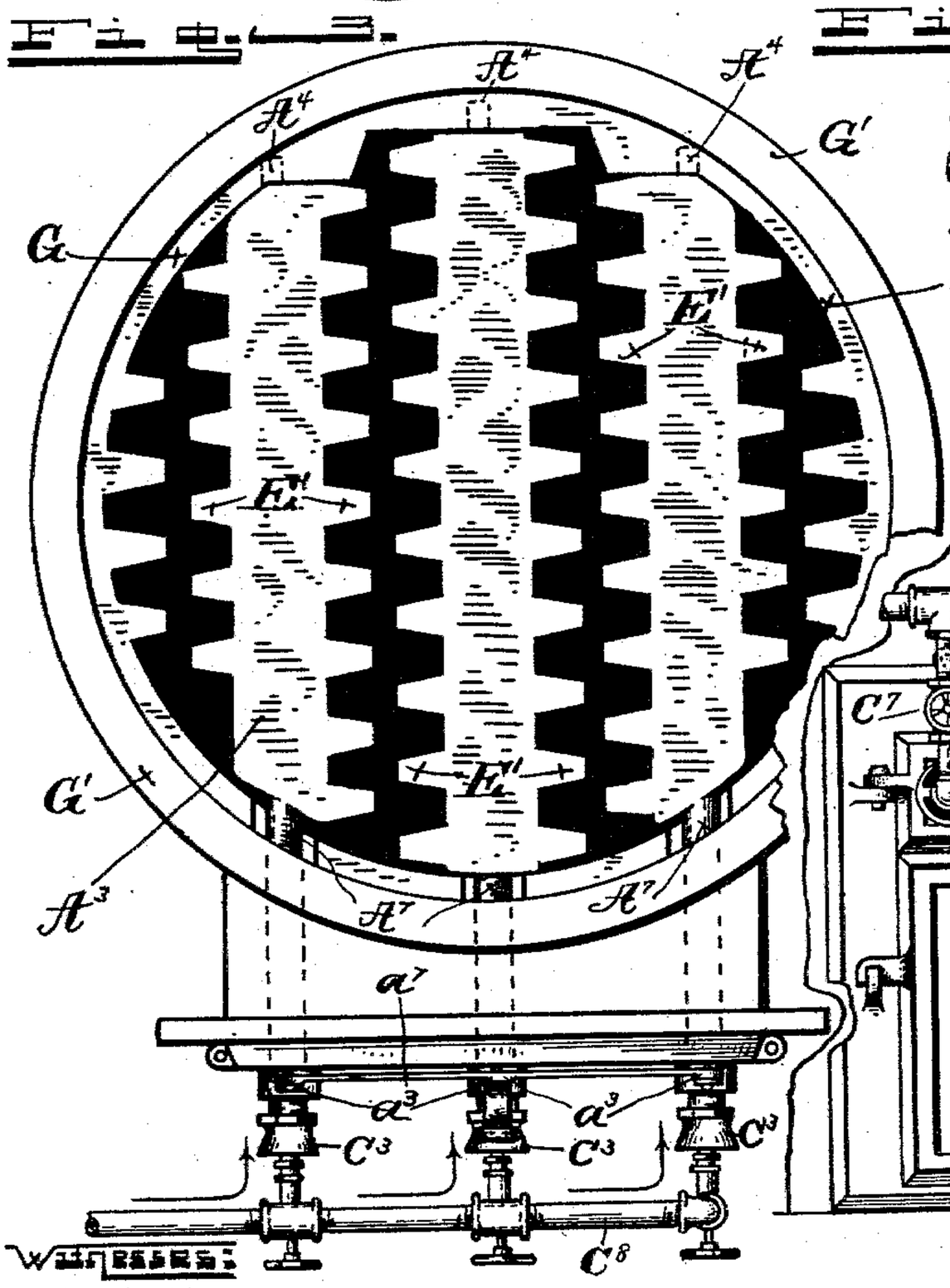


Fig. 6.

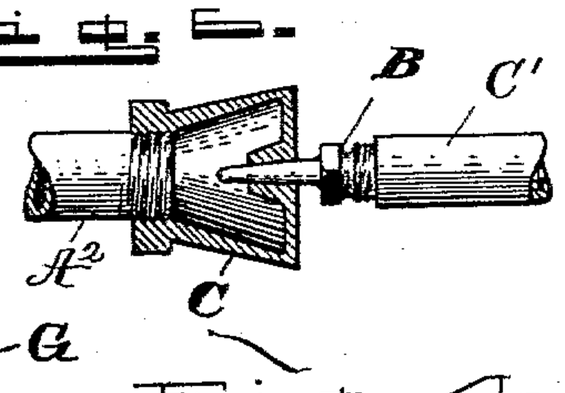
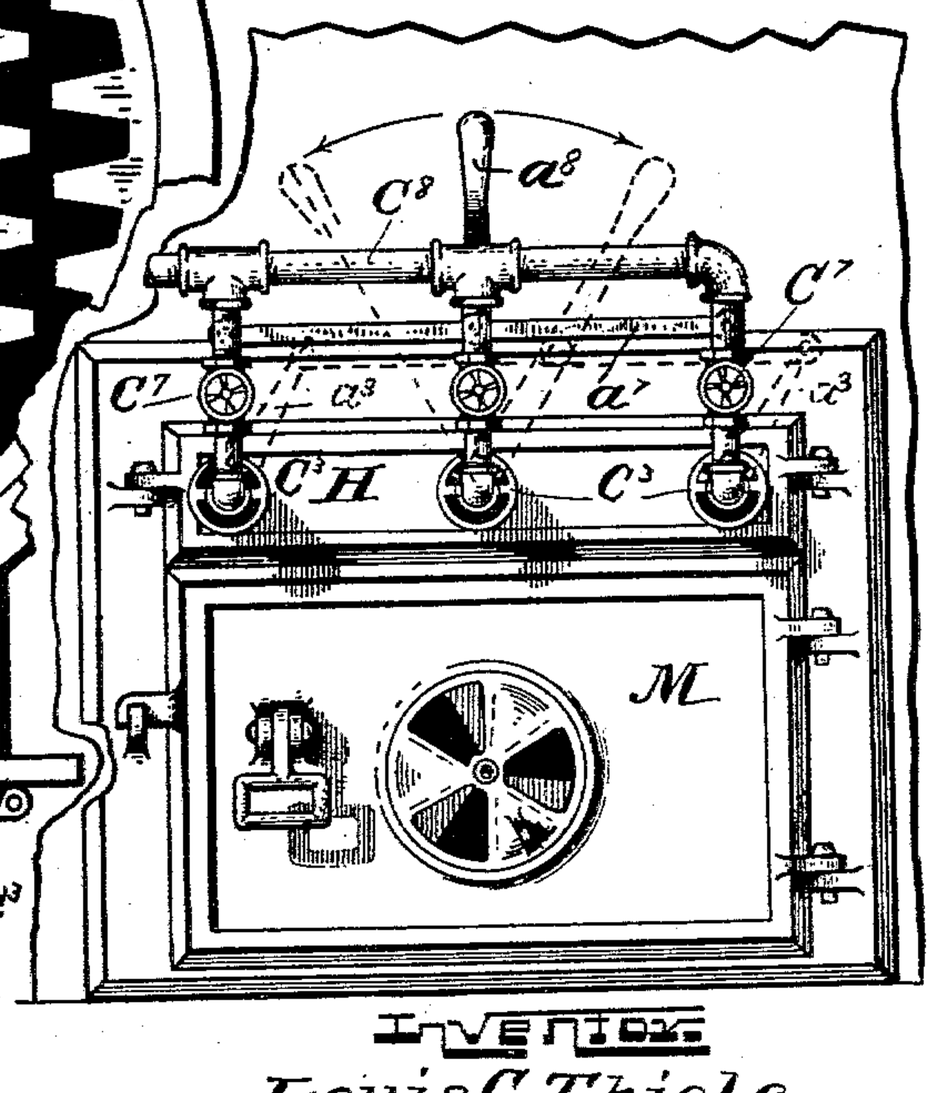


Fig. 4.



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UNITED STATES PATENT OFFICE.

LOUIS C. THIELE, OF INDIANAPOLIS, INDIANA.

COMBINED GAS-BURNER AND GRATE-BAR.

SPECIFICATION forming part of Letters Patent No. 565,050, dated August 4, 1896.

Application filed January 13, 1896. Serial No. 575,369. (No model.)

To all whom it may concern:

Be it known that I, LOUIS C. THIELE, a citizen of the United States, residing at Indianapolis, in the county of Marion and State of Indiana, have invented certain new and useful Improvements in a Combined Gas-Burner and Grate-Bar; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

The object of this invention is to provide a combined fuel-gas burner and grate-bar for furnaces and stoves so constructed that either gas or coal can be used as fuel in succession without any change in the equipment of the fire-pot, and in which the gas and coal can be burned simultaneously without interference, if so desired, and without danger of filling up the gas-outlets with ashes and cinders from the coal.

I accomplish the objects of the invention by the mechanism illustrated in the accompanying drawings, in which—

Figure 1 is a plan view of my burner as adapted for use in cook-stoves. The burner is shown detached from the stove. Fig. 2 is a transverse section on the line 2 2 of Fig. 1. Fig. 3 is a detail in plan view of the fire-pot of a furnace equipped with my improved burner. The figure shows the lining of the fire-pot and the doors and connections leading into the ash-box of the furnace; also, the pipe connections with the burners. Fig. 4 is a detail in elevation of the lower part of the furnace-front, showing the double lower doors, pipe connection with the burners, and the shifting-bar for shaking down the ashes from the fire-pot into the ash-box. Fig. 5 is a transverse section through one of the furnace grate-bars, the plane of intersection being through a pair of the lateral lugs integral with the grate-bar. Fig. 6 is a detail in vertical section of the mixer used with my improved grate-bar and shows how the tip turns in the mixer to allow for the rocking of the grate-bar.

Similar letters of reference indicate like parts throughout the several views of the drawings.

In the construction shown in Fig. 1, which is designed for use in cook-stoves, but can also be adapted for use in other kinds of stoves or furnaces, A is a hollow bar extending horizontally across the bottom of the fire-pot. It has the trunnion A′ to enter a suitable opening in the lining of the fire-pot, (not shown,) which forms a bearing for the end of the burner, and A^2 is a neck, which will be projected through an opening in the lining and wall of the stove to the outside of same. This neck will form the trunnion for the support of its adjacent end of the bar A. The bar A will preferably be made from cast-iron cored out to present a hollow interior. The neck A^2 will preferably be a short piece of gas-pipe of suitable diameter, threaded at both ends. After the bar A has been placed in the stove the neck A^2 will be projected through the wall of the stove and screwed into the threaded opening in the end of the bar A. To the opposite threaded end of the neck the mixer C will be screwed. The tip B fits loosely into the mixer C and enables the bar to be turned back and forth in rocking the grate-bar.

D are lugs integral with the bar A and forming a grating to support the coal when coal is used as a fuel. The lugs are arranged in series in two rows on opposite sides of the bar. E are lugs or guards also integral with the bar, but are of less length and are preferably elevated above the lugs D, and are placed opposite the spaces between the lugs D.

Immediately underneath the lugs E are the openings *e*, which are formed by drilling through the walls of the bar A. These openings form the outlets for gas from the hollow interior of the bar A into the fire-pot of the stove. The gas is introduced into the hollow bar A through the pipe C′, which pipe C′ is connected with gas-mains in the usual way. The main purpose of the lugs E is to form an overhanging projection to act as a shield or guard and to keep ashes, when coal or other solids are burned on the grate, from filling up the gas-outlet underneath.

A further object in using the lugs E is to increase the efficiency of the grate for burning garbage, which will be held from dropping through the grate by the lugs, which will form an obstruction.

The gate-bar is mounted on trunnions to

permit of a rocking movement, whereby the ashes on the grate-bar can be shaken down into the ash-box.

Only a single bar will be used in a stove, and for that reason the lugs D are made long enough to reach to the side of the fire-pot.

In the modified construction shown in Fig. 3, which is an adaptation of the burner to the fire-pot of a furnace, the lugs D are dispensed with and the lugs E are extended to form the lugs E′, underneath which the openings *e′* (see Fig. 5) are drilled in the same manner as shown in Figs. 1 and 2 and for the same purpose, the lugs E′ forming a guard to keep the gas-outlets from choking up. In this modification, A^3 represents the bar. The number of these combined grate-bars and gas-burners used in each furnace will depend on the size of the fire-pot. In the drawings, Fig. 3, the number used is three, and they are arranged so the lugs of one bar with its underlying gas-outlet will be opposite the space between the lugs of the next adjacent bar, so as to present as little obstruction as possible to the passage of the gas-flame into the fire-pot. The natural upward trend of the gas-flame from the burners will be increased by contacting with the rounded sides of its opposite burner.

G is a ring which will be fastened in any suitable manner to the walls of the ash-box or to the table G′ for the support of the lining of the fire-pot. It forms the bearings for the burners, which are provided with the trunnions A^4 and the necks A^7. The necks A^7 are long enough to extend through to the outside of the furnace, and to save cutting holes in the walls of the furnace for the passage of the pipes I will prefer to make a stationary door H, through which holes will be made for the pipes. The advantage of this construction is that when at any time it is desired to dispense with the gas connections the door with the openings for the pipes can be removed and a door without openings substituted, the cost of the change thereby being nominal.

The grate-bars are provided with vertical arms a^3, which are connected together by means of a bar a^7, whereby when a longitudinal reciprocating movement is imparted to the bar a^7 the three grate-bars will be simultaneously rocked. A lever a^8, connected with the middle arm, in fact being an extension of said arm, affords a handhold by which the grate-bars may be rocked. Fig. 3 shows the mixers C^3 placed outside of the door H, and C^7 represents the valves by which the supply of gas to the burners is regulated. These valves are better shown in Fig. 4. To concentrate the parts and keep them from projecting out from the furnace, so as to prevent free access to the ash-box door M, I prefer to run the pipes vertically after leaving the mixers and place the valves in the vertical sections of the pipe. C^8 is a pipe connecting the pipes from the burners together and connecting the burners with the supply-mains in the usual manner.

Having thus fully described my invention, whatI claim as new, and wish to secure by Letters Patent of the United States, is—

A combined grate-bar and gas-burner consisting of a hollow casting provided with trunnions one of which is hollow and is connected with a mixer and gas-supply pipe, which casting is formed with two sets of lugs extending outwardly therefrom on each side thereof arranged alternately and in planes one above the other, the lugs of one set, D, of which being of the length required to span the width of fire-pot desired, and having straight top edges to support the fuel, and those of the other set, E, of which being interposed between and of less length than the lugs D and being formed with points overhanging the gas-openings, which gas-openings are formed immediately beneath and close to the under side of said lugs E, in a plane substantially the same as that in which the top edges of the lugs D are located, whereby said openings are protected from being clogged by any material being burned, substantially as set forth.

In testimony whereof I affix my signature in presence of two witnesses.

LOUIS C. THIELE.

Witnesses:

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COLLIE E. RUMSEY.