(No Model.) 2 Sheets—Sheet 1.

O. F. GRANT.

GAS FIRE FOR HEATING OR OTHER PURPOSES.

No. 457,081. Patented Aug. 4, 1891.

Fig. 1

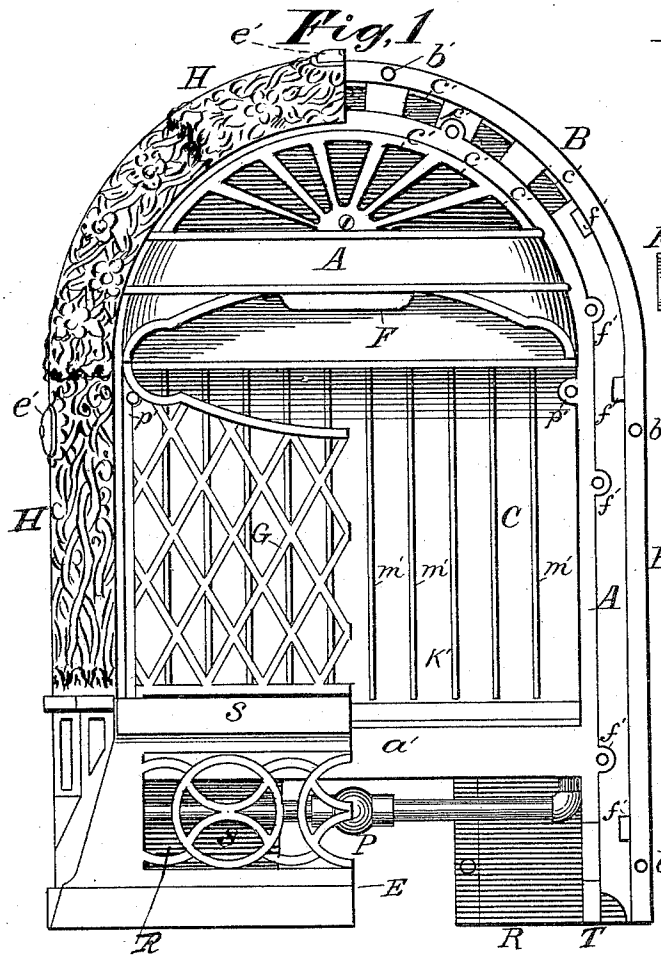


Fig. 2

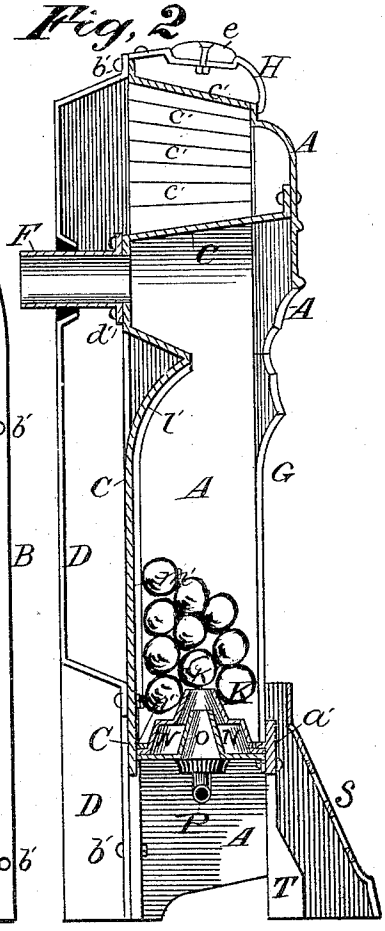


Fig. 3

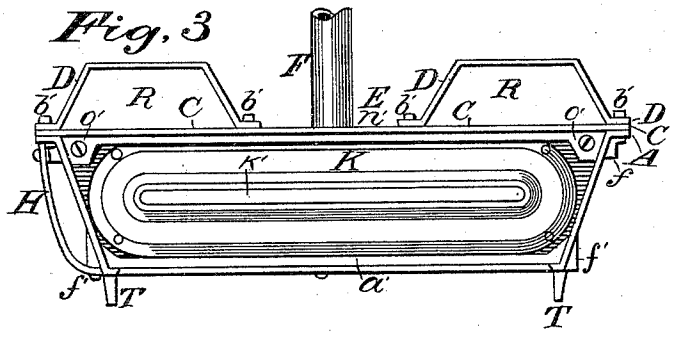
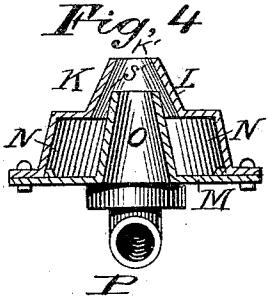


Fig. 4



Witnesses
J. W. Geyser.
Geo. Geyser

Inventor
Oscar F. Grant.

By Attorney
J. B. Geyser.

THE NORRIS PETERS CO., PHOTO-LITHO., WASHINGTON, D. C.

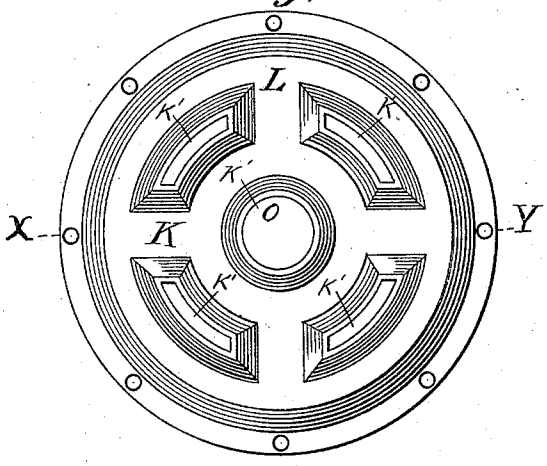
(No Model.) 2 Sheets—Sheet 2.

O. F. GRANT.

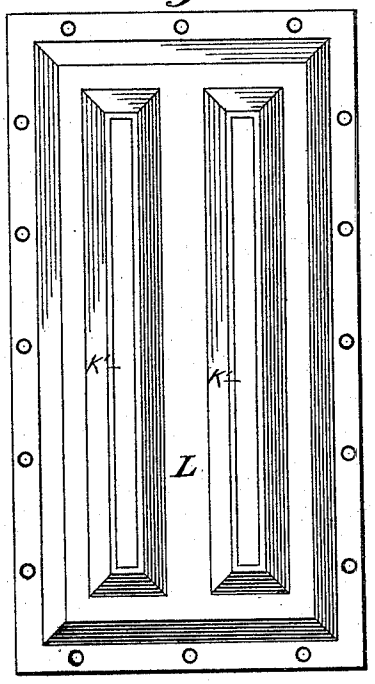
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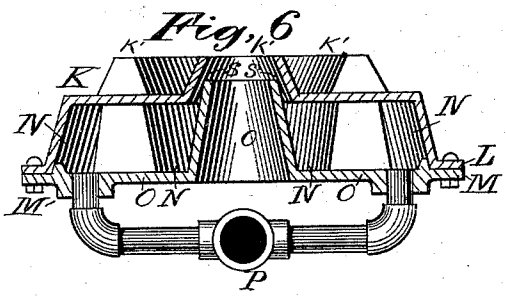
Fig, 5



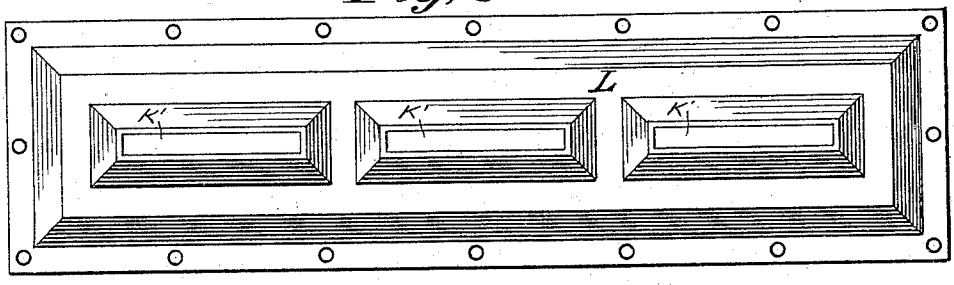
Fig, 7



Fig, 6



Fig, 8



WITNESSES:

J. W. Geyser

Geo. Geyser

INVENTOR

Oscar F. Grant.

BY

J. B. Geyser.

ATTORNEY.

THE NORRIS PETERS CO., PHOTO-LITHO., WASHINGTON, D. C.

UNITED STATES PATENT OFFICE.

OSCAR F. GRANT, OF PITTSBURG, ASSIGNOR OF ONE-HALF TO FRANCIS J. TORRANCE, OF ALLEGHENY, PENNSYLVANIA.

GAS FIRE FOR HEATING AND OTHER PURPOSES.

SPECIFICATION forming part of Letters Patent No. 457,081, dated August 4, 1891.

Application filed November 4, 1890. Serial No. 370,358. (No model.)

To all whom it may concern:

Be it known that I, OSCAR F. GRANT, a citizen of the United States, residing at Pittsburg, in the county of Allegheny and State of Pennsylvania, have invented certain new and useful Improvements in Gas Fires for Heating and other Purposes; and I do 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, reference being had to the accompanying drawings, and to the letters of reference marked thereon, which form a part of this specification.

My invention relates to that class of stoves intended to occupy the position of the ordinary fire-place, although it may be used in any other situation. It is constructed for the consumption of gas only.

In the drawings like letters of reference refer to like parts.

Figure 1 is a front view with one-half of the exterior ornamental parts removed to show the construction. Fig. 2 is a vertical section. Fig. 3 is a cross-section just above the burner, and Fig. 4 is a cross-section of the burner on an enlarged scale.

The main body of the stove is formed of three pieces, to which all the others, with the exception of the shutter, are attached.

A is the front part, of an arched form, with the cross-bar a' at about one-third of the height of the opening from the floor and having the fitting flange B around its outer edge. This fitting flange for a portion of the way on each side is recessed to receive the sides of the dividing-plate C, which conform in outline to it, and when in place form a level surface for the flange of the back plate D to rest upon. At its upper end the plate C inclines forward into the body of frame A below the air-passages c' c', and is packed securely and bolted at the center to the front of A. The back plate D is similar in form to the front of the stove, but shallower in depth of projection, and has a solid back, save where the collar F passes through, on which the pipe is placed. It has at its lower part a square recess E to allow the gas-supply pipe P and attachments to be adjusted. The pipe-collar F is bolted to the dividing-plate C at d', and when this attachment is made and joints are properly packed the three plates are united by bolts passing through the flanges B at b' b' and the body of the stove is formed. The cross-bar a' of the front is of a T-section, the lower side of the inside flange thereof acting as a stop against and to which the burner is attached, while the upper side acts as a step to receive the lower edge of the grate G. The top of the front assumes a hood-like projection, a portion of which is pierced with air-openings c' c', and the arched part forming the sides has similar openings for the same purpose.

The stove is ornamented with plates H H, fastened upon the sides of the front piece. All of these that extend above the level of the burner are of an open-work design, the spaces permitting the passage of the heated air. They are secured by screws, which pass through them and enter the bosses f' f' f' on the front. They may also have tile ornaments e' e'.

The burner K is formed of two pieces, which are bolted together. It has a long opening k' extending the full front of the fire. Its construction is shown best in the enlarged section Fig. 4, where L is the upper part and M the lower part. The gas-supply is introduced at both ends of this burner and fills the spaces N N. The conical partition O of the lower part admits a free supply of air. The cone on the top part overhangs and extends above the top of the lower one. A fine opening is allowed for the escape of gas along the sides between the two cones at s', from whence it issues, and is by the construction compelled to impinge upon and mix with the column of air rising through O, thus preparing it in the best manner for the production of heat when it reaches the point of combustion at k', the top of the burner. The supply being at both ends, the tubing is by ordinary fitting carried to the center under the burner, and there by means of a T is connected with a larger pipe P and the usual air-mixer, which extends backward through the opening E or in any direction required to attach to the supply-pipe.

The dividing-plate C forms also the back or fire plate of the stove, and has a project-

ing curvature l' at the top of the fire to cause the heat to flow outward. It has also the ribs m' m' in a vertical position to add strength. At its base on the rib n' are lugs o' o'. These are at the same height and parallel with the rib on the cross-bar of the front and serve to stop and secure the back of the burner, which is fastened to it by screws in the lugs.

The grate G is an open-work piece rising from the front edge of the burner, resting between it and the cross-bar of the front, and is held at the top by being bolted to two lugs on the main front piece at p' p'. When in place, it leaves an open space below the hood projection of the front, which allows the filling of the space between the grate and the dividing-plate or fire-back with refractory material, such as fire-clay balls or pieces of pottery, &c. By taking out the bolts it is readily removed.

In operation, the gas being ignited causes an upward rush of air through the cone opening O. The gas enters some distance below the top of the burner and at an angle to the moving air. It and the air are thoroughly commingled and the result is a complete combustion, which produces an intense heat at the base of the mass of refractory material held within the grate, and it becomes of a white heat from base to top, radiating from thence into the room. The fire-back or dividing-plate becomes red-hot, and the air between it and the back being heated rises and escapes into the apartment through the passages c' c' in the top, thus creating a vacuum and causing a flow upward through the side ducts R R at the base and a continuous flow of heated air is created.

I am aware that burners have been constructed with a central flow of air through a cone-shaped opening, but as the air is carried above the point of combustion there is no economy in their use, as the fluids have but slight opportunity to mingle. In my burner the discharge of gas is a distance below the final exit or point of combustion, and the inward slope of the top part of the burner at s' causes the impact of the escaping gas upon the ascending flow of air through O, enforcing a commingling of the two fluids, thus producing an intense flame and perfect combustion of the gas admitted, the supply of which may be reduced to the lowest amount required to keep the fire in operation.

As it is evident that my burner can be made of many varieties of shape and form and still retain the vital point—that of admitting the gas below the point of combustion and forcing it by inclined walls to an impact upon the inflowing air, and thus causing the mingling of the two fluids—I have shown in Figs. 5, 6, 7, and 8 certain variations, but do not confine myself to them alone, as the forms may be changed to all shapes imaginable. Fig. 5 is a top view of a round form, and Fig. 6 is a section of the same through the line X Y and shows the piping for two points of supply, although one point of supply can be used. Fig. 7 is a top view of a square burner with two long openings for burning, and Fig. 8 is a long burner with three openings.

The shutter S is a loose piece with open-work ornamentation to act as a fender, closing up the front below the cross-bar a' and hiding the fittings, &c., below the burner. It rests upon the hearth and upon the front, covering the projecting feet T T that assist in supporting the stove.

Although I have herein shown the best application of my fire for heating purposes, it can also be used for cooking, baking, &c., by adapting the burner to such particular cases, and the outer ornamental plates H H can be of any ornamental design, so that the air-openings are retained.

Having thus described my invention, I claim and desire to secure by Letters Patent—

A gas-burner for fire-places, composed of two parts bolted together, having a space for gas between, connected with a source of supply, the lower part provided with an air-opening conical in section and the upper part provided with a matching opening of similar section, but with the walls thereof at a less incline to the vertical than those below, and the upper edges of which form the point of combustion, a thin narrow slot thus being formed for the escape of the gas at some distance below this point formed by the top edge of the air-opening coming nearly in contact with the sides of the cone above, whereby the gas is discharged at opposing angles from each side into the column of ascending air, thus compelling a mingling of the two fluids, substantially as and for the purpose herein set forth.

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

OSCAR F. GRANT.

Witnesses:
LOUIS MOESER,
HENRY KLEIN.