

(No Model.)

V. W. BLANCHARD.
GAS STOVE.

No. 569,086.

Patented Oct. 6, 1896.

Fig. 1.

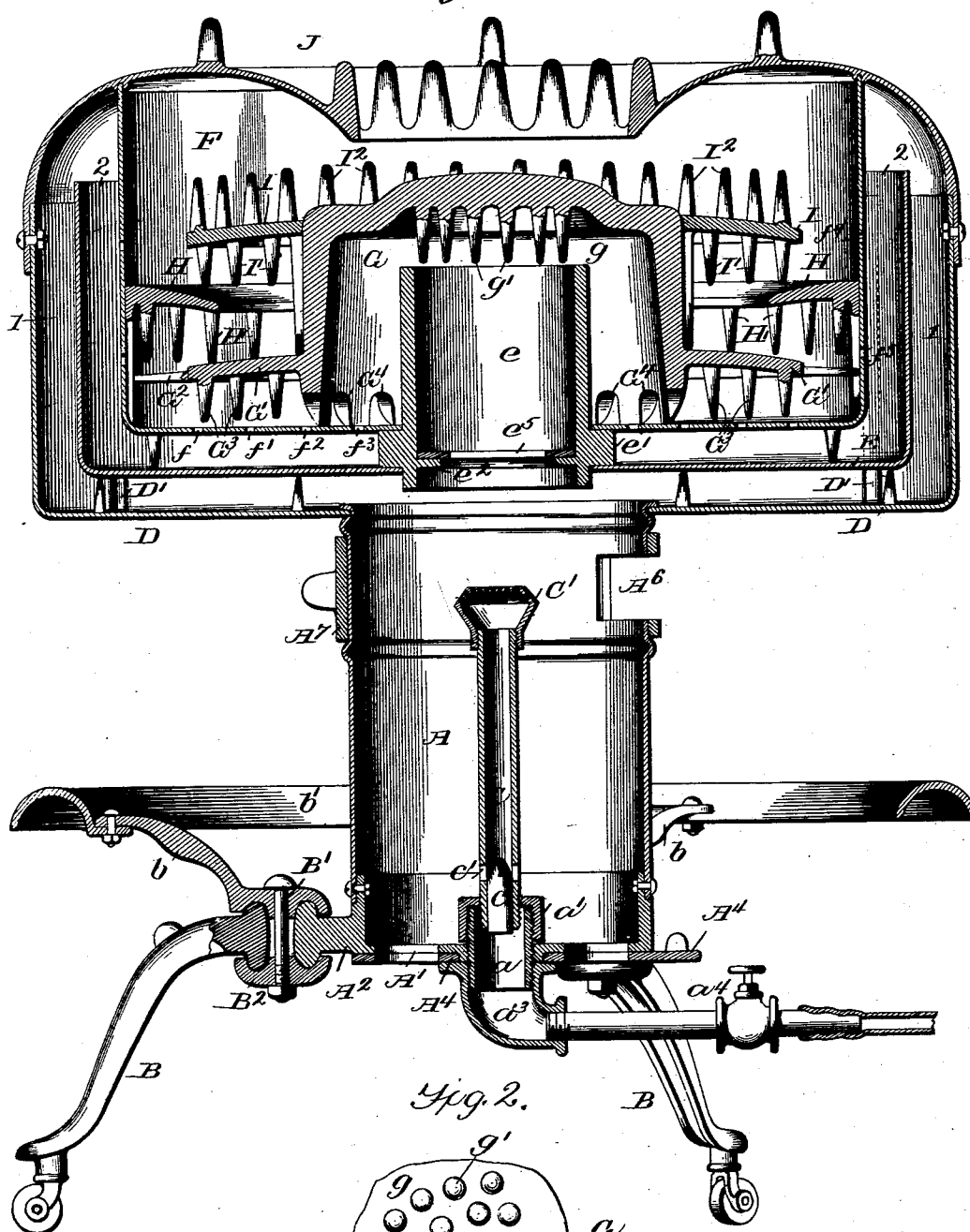
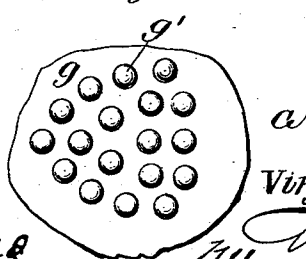


Fig. 2.



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GAS-STOVE.

SPECIFICATION forming part of Letters Patent No. 569,086, dated October 6, 1896.

Application filed March 18, 1896. Serial No. 583,719. (No model.)

To all whom it may concern:

Be it known that I, VIRGIL W. BLANCHARD, of New York, in the county of New York and State of New York, have invented certain new and useful Improvements in Gas-Stoves; and I do hereby declare that the following is a full, clear, and exact description thereof, reference being had to the accompanying drawings, and to the letters and numerals of reference marked thereon, which form part of this specification.

This invention is an improvement in gas-burning heating-stoves; and its object is to increase the air-consuming capacity of such stoves and thereby attain greater economy in their operation, more complete consumption of the combustible gases in the fuel burned, and as a result increased heat.

The invention therefore consists in the combination and construction of parts herein-after claimed.

In the accompanying drawings, Figure 1 is a vertical section through the improved heater adapted for consuming ordinary illuminating or heating gas. Fig. 2 is a detail.

A designates a small upright cylinder, closed at bottom by a cap A', having a laterally-projecting flange A², which is T-shaped in cross-section.

B B designate legs supporting the cylinder and attached to the flange by means of bolts B' and clamp-pieces B², said bolts passing through radiating arms b, which support a foot-ring b', the ends of the arms and the clamp-pieces being shaped to bind the ends of the legs and the edge of flange A², as shown, and thereby hold the parts together. Through the center of cap A' is screwed a short pipe-section a, on the upper end of which is a screw-cap a', into which is screwed an upstanding pipe C, having a burner C' on its upper end and perforations c' near its lower end, beside a gas-tip c, screwed into the lower end of pipe C.

On the lower end of section a is screwed an elbow a³, to which is connected a valved joint a⁴, which may be connected by a flexible or other pipe to a gas supply. Fitted to the bottom of cap A' is a plate A⁴, which can be rotated, and there are openings in the cap A' and plate which when the plate is turned

one way register and admit air into the cylinder. In the cylinder, opposite the burner C', is an opening A⁶, which can be closed by a ring-valve A⁷, as indicated in the drawings. 55

On the upper end of cylinder A is supported a large pan-shaped casing D, within which is a slightly-smaller deflector E, which is centered and supported in casing D by studs D' in such manner that an air-space 1 60 is left between the casing and deflector, as shown, this space communicating with the interior of cylinder A, as shown.

Set within a central opening in deflector E is a short upright tube e, which depends slightly below the deflector and is supported therein by a lateral flange e', and near the lower edge of tube e is an internal flange e², on which is supported a removable annulus e⁵. Within deflector E is a combustion chamber F, formed by a pan-shaped vessel slightly smaller than deflector E, and supported and centered on the flange e' of tube e, which projects upward centrally in chamber F, as shown. A second air-passage 2 is formed between the combustion-chamber and deflector, and communicates with passage 1 over the top edge of deflector. 75

Within chamber F and over tube e is a dome G, which is considerably larger than the tube 80 and has a laterally-projecting flange G' near its lower edge, which is provided with radiating studs G², by which the dome is centered in chamber F. In the ceiling of the dome, just over tube e, is a central cavity g, within which are a number of depending studs g', which almost enter the end of tube e, these studs being arranged, as indicated in Fig. 2, so as to absorb heat and retard the flow of gases. The flange G has a number of depending studs G³ on its under side for the purpose of breaking up and mixing gases which escape from the dome through passages G⁴ in the lower edge thereof. 85

Above flange G' and fitted against the sides of chamber F is an annulus H, having a series of depending studs H', and above annulus H and fitted against the dome, is another annulus I, having depending studs I' and upstanding studs I², as shown. 90

In the bottom of chamber F are concentric series of perforations f f' f² f³, and in the 100

sides of the chamber opposite flange G' and annulus I, respectively, are perforations f^5 f^4 , respectively.

A cover J is fitted to casing D and so shaped
5 as to also fit against the upper edge of the walls of chamber F, and its center is depressed into the chamber and has a central outlet-opening, as shown.

The internal diameter of ring e^5 determines
10 the volume of air admitted into tube e , which should be proportioned to the size of the gas-tip placed in the burner-tube below. If the volume of gas is increased by using a larger gas-tip at any time, a correspondingly larger
15 ring e^5 should be used.

When the walls of tube e are perpendicular, the ring e^5 keeps the gases away from the sides of the tube, near the ring at least, and the upper portion of tube becomes more highly
20 heated than the lower portion and concentrates the heat in cavity g . The studs g' are heated almost instantaneously from the flame of the burner and thereby assist materially in producing perfect combustion in the dome,
25 especially at the time of the primary ignition of the gases, thereby preventing odors while the body of the dome is being heated.

Operation: The gas or other suitable combustible fluid is mixed with air as it flows
30 through tube C and then is ignited at burner C'. The heated products ascending into tube e draw air into cylinder A, part of the air mixing with the gases entering tube e and part flowing into the air-passage 1. The burning
35 gases ascend through tube e into the dome G, where they are retarded, and descend in the dome outside tube e , and at the bottom of the dome they are mixed with jets of hot air entering through perforations f^3 . They then
40 pass from the dome under flange G', where they are subjected to more jets of air from perforations $f' f' f^2$, and as they turn back over flange G' they receive another quota of air from jets f^3 , and after they pass out from
45 under annulus I they receive another modicum of air through perforations f^4 . The air from passage 2 is heated by contact with the walls of chamber E and is in condition to accelerate combustion of gases when it is ad-
50 mitted thereto. By these means the process of combustion in the heater is progressive in character, small volumes of heated air being added to the gas in minute jets at intervals and heat developed by combustion thereof
55 before another quota of air is added. Thereby I avoid cooling of the combustible gases and increase their temperature gradually.

The currents of burning gases being repeatedly broken or mixed by the numerous
60 studs in their way through the combustion-chamber and by abrupt reversals of direction raise the internal structure of the stove to an intensely-heated condition and the combustion is so complete that no odors are gener-
65 ated. By this means I am able to intermingle from thirty to fifty cubic feet of air with a single cubic foot of gas and maintain the

dome and internal parts at such a high temperature that approximately complete combustion of the gaseous elements is realized. 70

By this apparatus I not only burn all the carbon in the gases, but am enabled to burn a great portion, if not all, of the lighter combustible elements therein with, of course, a
75 resultant saving in fuel and the production of higher temperature in the stove.

Inclosing the dome in the combustion-chamber facilitates its heating and enables it to be easily maintained at a high temperature.

Having thus described my invention, what
80 I claim as new, and desire to secure by Letters Patent thereon, is—

1. The combination of a gas-burner, a tube above the same, and a dome over the tube into which the products of combustion are
85 delivered, said dome having depending studs over the tube, substantially as described.

2. The combination of the combustion-chamber, a tube therein, a burner below the tube, a dome over and partly inclosing the
90 tube having a radial external flange and an inner cavity in which are depending studs and means for admitting air to said combustion-chamber, substantially as described.

3. The combination in a heater of a combustion-chamber, a dome therein into which
95 the combustible fluid is delivered, a casing inclosing the dome, and a series of two or more superimposed alternately-disposed annuli in the combustion-chamber, exterior to
100 the dome, between which the combusting gases are successively passed, and means for injecting air at intervals into the gases, substantially as described.

4. The combination of the combustion-chamber having an air passage or chamber
105 around its walls and bottom communicating with said combustion-chamber, a dome supported in said chamber, a series of two or more annuli in the combustion-chamber, and
110 means for supplying combustible fluid to the dome, substantially as described.

5. The combination of the combustion-chamber, a dome therein having a lateral
115 flange near its lower edge, an annular ring on the side of casing above the flange, and another annulus surrounding the dome above the ring; with means for admitting combustible fluid to the dome and means for admit-
120 ting air to the combustion-chamber, substantially as and for the purpose set forth.

6. The combination of the combustion-chamber, a dome therein having a lateral
125 flange near its lower edge, an annulus on the side of casing above the flange, another annulus surrounding the dome above the ring, said flange, ring and annuli being studded
130 substantially as described, and means for injecting air into the gases passing from the dome past the flange, ring and annuli, with means for admitting combustible fluid into the dome, substantially as and for the purpose set forth.

7. The combination of the combustion-

chamber, the casing; a tube supported therein projecting into the combustion-chamber, a dome in the combustion-chamber, inclosing the tube, and two or more annuli surrounding said dome, with means for admitting air into the gases in the combustion-chamber, substantially as and for the purpose described.

8. The combination of the deflector E, the tube *e* therein, the combustion-chamber F within deflector E, the dome G, having flange G' in chamber F, and the annuli H and I, surrounding the dome and means for admitting combustible fluid to the dome and means for admitting air to the combustion-chamber substantially as described.

9. The combination of the combustion-chamber F, casing D, and deflector E; dividing the space between the chamber and casing into air-passages which communicate with the combustion-chamber, the tube *e* supported on deflector E and projecting into the combustion-chamber; the dome G in the combustion-chamber, over tube *e*, having flange G', and the annuli H and I; exterior to the dome; with the burner below the tube, and means for supplying gas and air to the burner, substantially as and for the purpose set forth.

10. The combination with the cap A' having lateral T-flange A², the legs B, and the arms *b*; with the bolt B' and clip-plates B² for securing the legs and arms to the flange, substantially as described.

11. The combination of the cylinder, the burner therein; the casing D supported on the cylinder, the combustion-chamber in said casing, the tube in said chamber above the burner, the dome superimposed over the tube having a cavity in its ceiling, and a lateral

flange; and the annuli H and I in the combustion-chamber exterior to the dome, and means for admitting air to the combustion-chamber for the purpose and substantially as described.

12. The combination of the cylinder, the gas-burner therein, the casing D on the upper end of cylinder, the combustion-chamber F in the casing, the deflector E between the casing and combustion-chamber, dividing the space between the chamber and casing into air-passages communicating with the combustion-chamber and the tube above the burner passing through the casing and deflector into the combustion-chamber; with the dome G over said tube, one or more annuli surrounding the dome; said annuli being studded, substantially as described.

13. The combination of the cylinder, the removable tube C therein having a gas-tip at one end and a burner at the other; the casing D, deflector E and combustion-chamber F supported on said cylinder; and the tube *e* above the burner having a removable ring *e*²; with the dome G in the combustion-chamber having internal cavity *g*, studs *g*', and external studded flange G'; the studded annulus H above the flange, the studded annulus I above annulus H, the cover; and perforations in the walls of the combustion-chamber for admitting jets of air into the burning gases therein, substantially as and for the purpose set forth.

In testimony that I claim the foregoing as my own I affix my signature in presence of two witnesses.

VIRGIL W. BLANCHARD.

Witnesses:

T. H. ALEXANDER,
JAMES R. MANSFIELD.