

(No Model.)

3 Sheets—Sheet 1.

H. G. & W. R. DAWSON.
GAS BURNING FIREPLACE.

No. 537,340.

Patented Apr. 9, 1895.

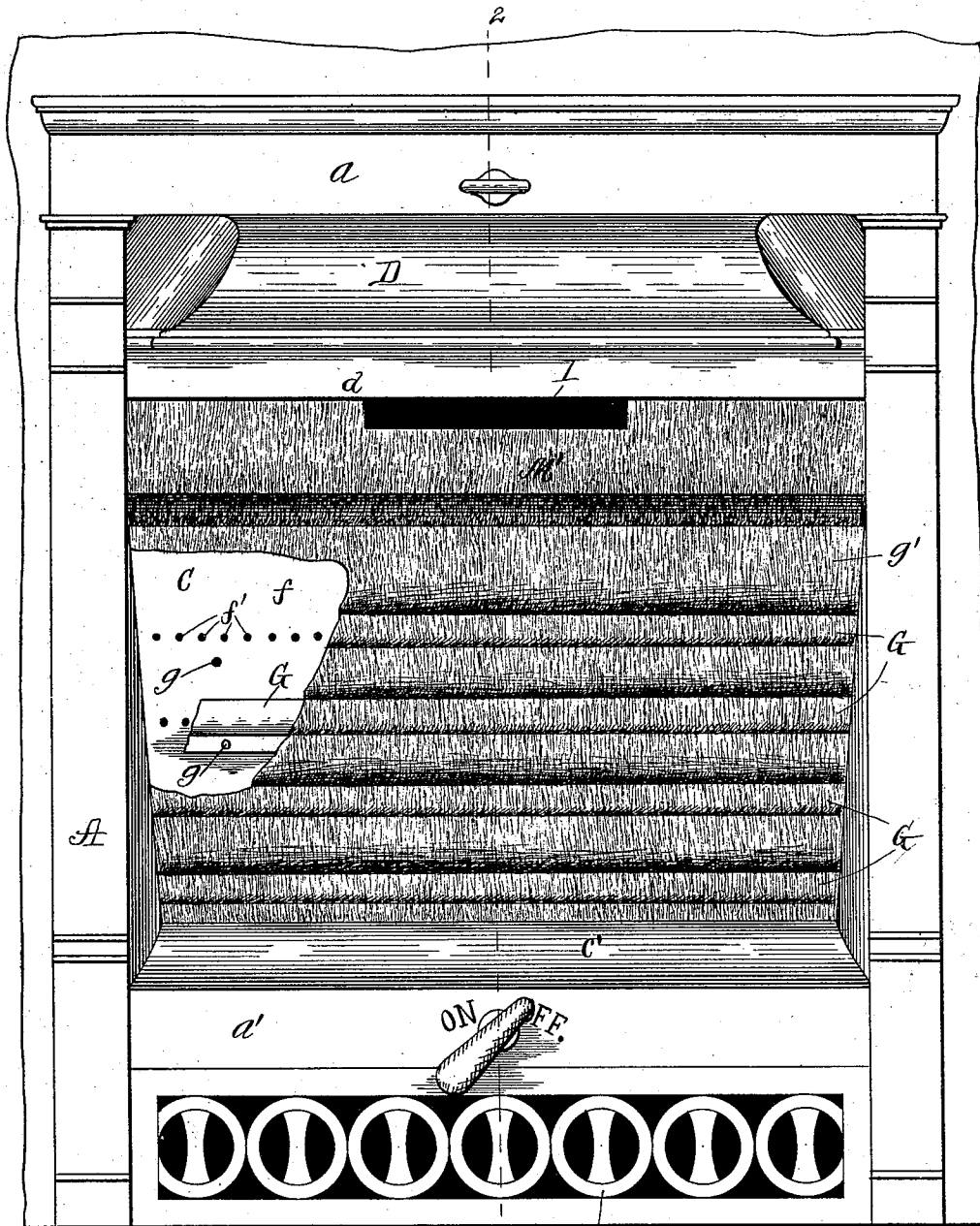


Fig. 1

Witnesses:

W. C. Corliss

Jno. A. Christianson.

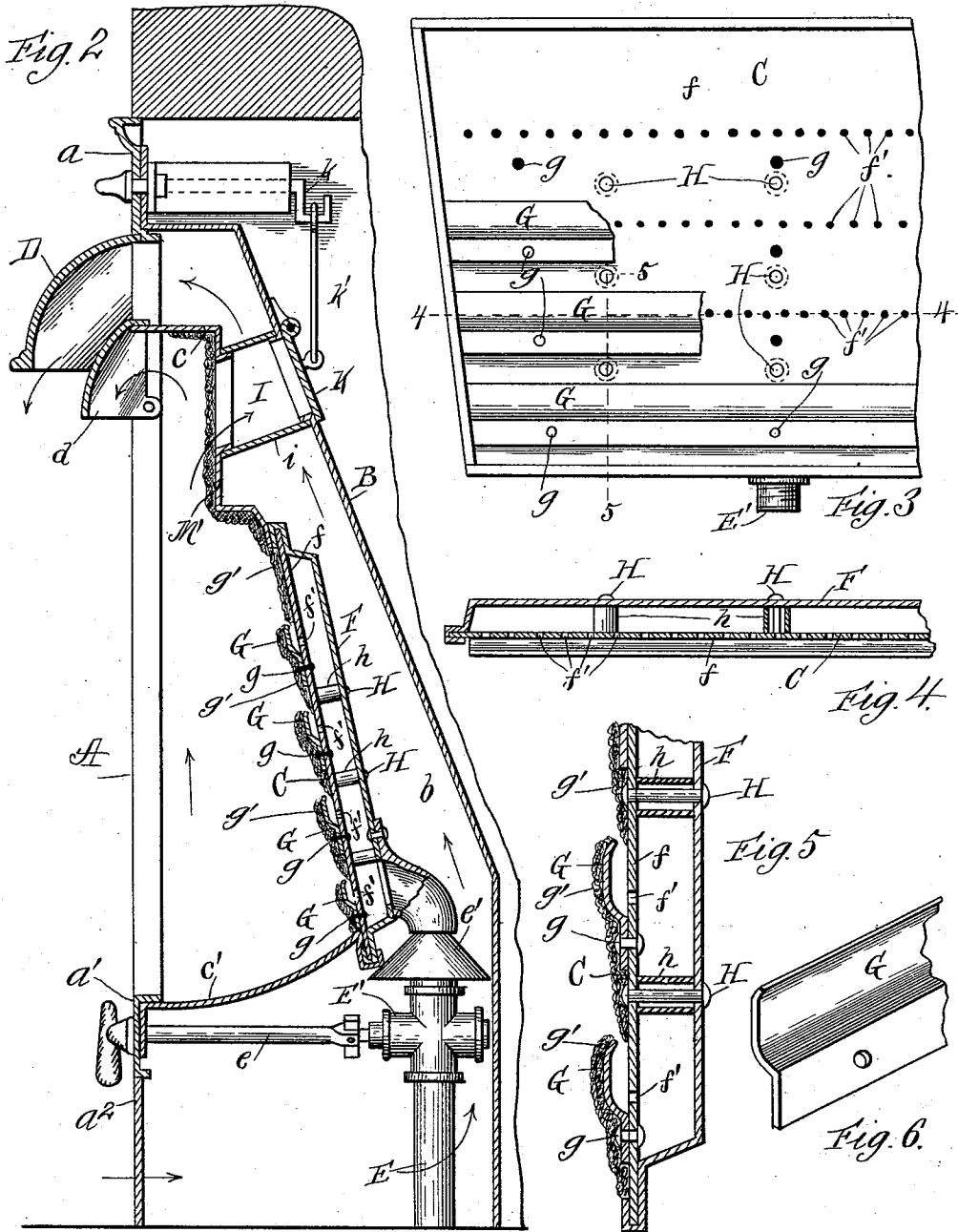
Inventors:
Henry G. Dawson
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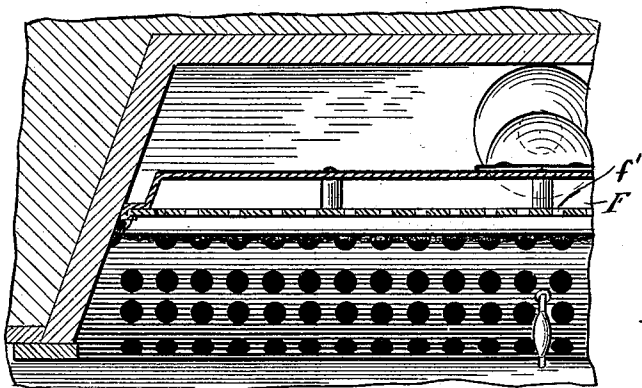
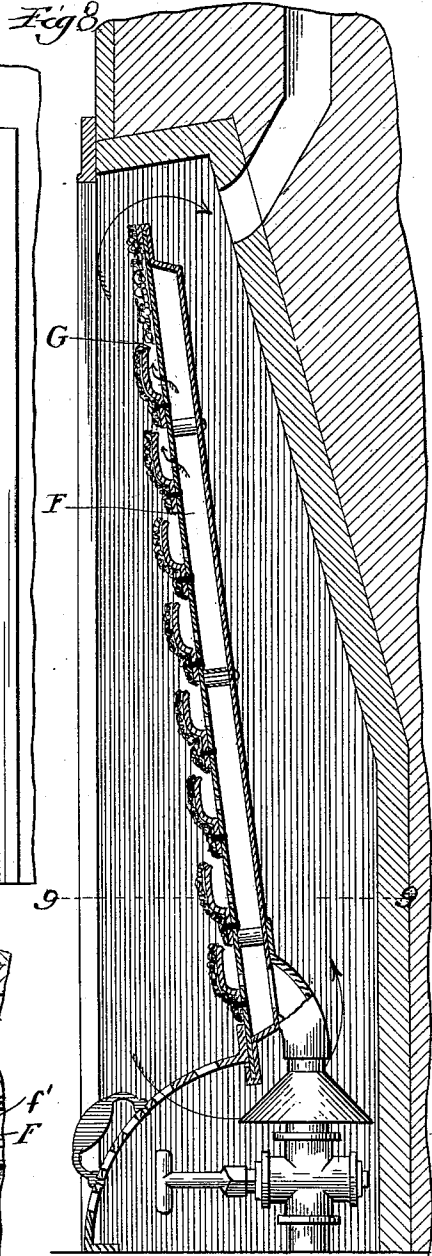
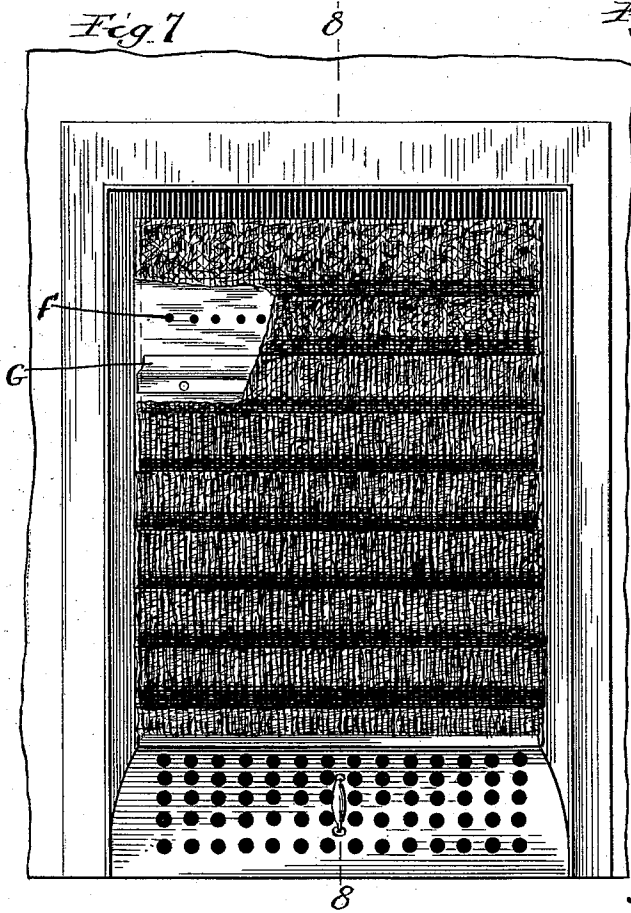
(No Model.)

3 Sheets—Sheet 3.

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Witnesses
N. C. Corlies
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Fig. 9.

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UNITED STATES PATENT OFFICE.

HENRY G. DAWSON AND WILLIAM R. DAWSON, OF CHICAGO, ILLINOIS.

GAS-BURNING FIREPLACE.

SPECIFICATION forming part of Letters Patent No. 537,340, dated April 9, 1895.

Application filed December 15, 1894. Serial No. 531,886. (No model.)

To all whom it may concern:

Be it known that we, HENRY G. DAWSON and WILLIAM R. DAWSON, citizens of the United States, residing at Chicago, in the county of Cook and State of Illinois, have invented certain new and useful Improvements in Gas-Burning Fireplaces; and we 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 and numerals of reference marked thereon, which form a part of this specification.

Our invention relates to gas burning fire places, and has for its objects the production of a continuous sheet of flame over the surface of the fire back; the securing of a perfect combustion; the prevention of the accidental extinguishing of some of the jets; and an increase of the general efficiency of the fire place.

It consists of a fire back, preferably of sheet-metal having a multiple number of burner ports extending substantially over its entire area and being covered by lips extending upwardly from the surface of the fire back, and being spaced apart from it at their upper edges.

It consists further of a gas chest of which the fire back is the front wall and from which the burner ports all lead.

It consists further in the construction of the case for carrying the fire back, in the manner described, whereby a free circulation of air and the proper ventilation of the apartment are secured.

It consists in various minor parts as hereinafter fully set forth.

To use gas economically and efficiently for heating by means of a fire place, it is best to throw a flame over a surface or fire back, inclined forwardly, and to provide for a circulation of air behind the fire back, so that it shall become heated and then be discharged into the room. Various means have been employed in the attempts that have been made to spread the flame over the entire surface of the fire back including the location of numerous burner ports throughout its area, each adapted to throw a jet of flame forward. Difficulty has been encountered in this form of

construction in securing a uniform pressure at the various ports, and in preventing the accidental extinguishing of a part of the jets, while the result has been simply to stud the fire back with small jets, rather than to cover it with a continuous sheet of flame as desired; and if any of these jets are overlooked in lighting the fire, or if the flame from any of them becomes accidentally extinguished, they will not ignite from their neighbors and the unburned gas is discharged into the apartment. These difficulties have been surmounted in the construction hereinafter described, and shown in the accompanying drawings, in which—

Figure 1, is a front elevation of our improved fire place with some portions of the burner broken away. Fig. 2, is a vertical section of Fig. 1, on the line 2—2. Fig. 3, is a front elevation of the fire back with some of its parts removed. Fig. 4, is a sectional view of Fig. 3, on the line 4—4. Fig. 5, is a sectional view of Fig. 3, on the line 5—5. Fig. 6, is a detail of a part of the burner. Fig. 7, is an elevation of an ordinary open fire place with our improved burner adjusted to it; and Fig. 8, is a vertical section of the same on the line 8—8. Fig. 9, is a detailed section taken on the line 9—9 of Fig. 8.

The uprights of the frame of the fire place are shown at A; the upper cross-bar at *a*; the lower cross-bar at *a'*; and the open "crown" or base plate at *a*². A sheet metal shell or casing B, extending back from the frame A, *a*, and conforming to the ordinary form of the opening in a fire place, carries the fire back C, and its appurtenances and forms therewith the air flue *b*, leading from the crown *c*², back of the fire back and discharging into the apartment from beneath the hood D, projecting forward and depending from the cross-bar *a*, the heated air being thrown forwardly and downwardly.

The fire back C, is secured to the casing B, in any desired manner. A wall or partition extends upwardly from its top and leads to the front of the fire place and is continued by the forwardly projecting depending hood *d*, which is below the hood D, and which throws the heated air which ascends in front of the fire back forwardly and downwardly so that it does not cross the column of air discharg-

ing from the flue *b*, and thereby check the circulation through it. The lower portion of the partition *c*, is curved forwardly from near the top of the fire back forming a cove *M*, and
 5 enlarging the upper portion of the flue *b*, thereby facilitating the heating of the air therein.

A reflector plate *c'*, extends from the cross bar *a'*, to the base of the fire back, preventing
 10 the air which enters through the open crown piece *a*², from being diverted from the flue *b*.

The fire back is formed of the front wall *f*, of a box *F*, made entirely of sheet metal and having air tight joints. Gas freely charged
 15 with air is delivered to the box *F*, by a mixer *e'*, served by a gas pipe *E*, whose valve is located at *E'*, and has a stem *e*, leading through the cross bar *a'*.

The wall *f*, is freely punctured with burner
 20 ports *f'*, which we prefer to locate in transverse rows as shown in Fig. 3, and which throw the gas jets directly forward from the face of the wall *f*. This arrangement of the burner
 25 holes *f'*, is behind a lip *G*, preferably of sheet metal, though any other incombustible material will answer. The lips *G*, are as shown, secured at their lower edges to the surface of
 30 the wall *f*, by the rivets *g*, and incline upwardly away from it, their upper edges being, as shown, bent in toward the surface, though the exact form of these lips in cross section
 may be varied according to the judgment of the maker. The effect of the lip is to form a
 35 pocket into which the gas is discharged from the burner port *f'*, and which is open above. Within this pocket the gas is burned in a mass, rather than in a jet and the flame issues
 40 out, and when the holes *f'*, are arranged in transverse rows as shown, the flame from the lower series reaches up over the lip above and overlaps the flame issuing from it.

By using one lip to cover a multiple number
 45 of burner ports, as shown, the pocket inclosed by it becomes filled with gas from end to end, and the flame issuing from it is uniform in intensity, so that the location of the
 50 ports is not indicated.

Asbestos in the wool form may be applied to the outer surface of the lips *G*, *G'*, as shown
 at *g'*, and also to the upper surface of the wall *f*, and the lower portion of the plate *c*.

The box *F*, is made of ample capacity so
 55 that the supply of gas is uniform to all the burner holes.

In starting the fire it is well to allow the box to become well filled with gas before
 60 applying the match. It is fired by applying a flame to any portion of the fire back, the whole becoming instantly ignited. It is impossible to blow the fire out as any blast merely forces the flame back into the pocket formed by the lip *G*, where it burns, the flow of gas from the
 65 holes *f'*, not being checked.

A perfect combustion of the gas is secured by the construction of the burner as shown,

as the temperature within the pockets formed by the lips, is very high and the carbon is consumed before the contact of the cool air
 70 of the apartment chills it. This form of burner is equally efficient with either the strong pressure at which natural gas is usually delivered to the consumer, or the pressure
 75 ordinarily found in artificial gas systems, as the current of air which naturally ascends in front of the fire back does not interrupt the discharge of the gas from the burner
 80 holes *f'*, but on the contrary tends to facilitate the discharge of the flame from the mouth of the pocket. In consequence of this feature
 85 the fire may be regulated to suit the pleasure of the user by varying the gas supply,—an advantage not heretofore secured in gas burning
 90 fire places of this type. So completely are the burner holes protected from the pressure of the air currents that the gas will continue to burn after the valve has been closed until the box *F*, is entirely emptied of it, the flame expiring first at the bottom of the
 95 burner.

As the front wall *f*, of the box *F*, becomes much hotter than its rear wall, its expansion is greater and it tends to become bowed. This
 100 tendency is wholly overcome by the use of the stay bolts *H*, *H*, passing through both walls and carrying the sleeves *h*, *h*, whose length is equal to the normal distance between the
 105 walls.

Provision is made for discharging the products
 110 of combustion into the chimney flue by forming the flue *I*, leading from the front of the fire back through the plate *c*, and casing *B*. The walls *i*, of this flue are air tight so that it has no connection with the flue *G*.

The flue *I*, is controlled by a damper *K*, closing its inner end and openable by means
 115 of a crank rod *k*, extending forwardly through the face of the frame of the fire place and connected with the damper by means of the
 120 link *k'*.

It is obvious that the burner herein described is not dependent upon the frame shown for its success, although the two combined constitute an exceedingly efficient
 125 heater. The burner is adapted for separate manufacture and to be mounted within the various styles of fire places now in use whether for the use of gas or coal.

We believe ourselves to be the first to provide for the discharge of a mixture of gas and
 130 air into a pocket or trough within which it is burned, the flame issuing from an opening provided for that purpose. We do not desire therefore to be limited to the details of construction herein described.

We claim as our invention—

1. A gas burner having an air and gas mixer and a substantially vertical face provided with rows of perforations for the escape of
 135 the mixed gas and air, each of the several rows of perforations having a deflector adapted to deflect the mixture upward in a substantially continuous sheet and the perforations and

deflectors being so spaced as to together discharge a practically continuous sheet of the mixture over the face.

2. A gas burner having an air and gas mixer and a substantially vertical face provided with rows of perforations for the escape of the mixed gas and air, each of these several rows of perforations having a deflector adapted to deflect the mixture upward in a substantially continuous sheet, the perforations and deflectors being so spaced as to together discharge a practically continuous sheet of the mixture over the face, and the deflectors and the intervening portions of the face between them being covered with wool asbestos.

3. A gas burner having an air and gas mixer and a substantially vertical face provided with a plurality of transverse rows of perforations for the escape of the mixed gas and air, a lip secured at one side only to the face and covering each row of perforations and forming with the face a pocket from which the mixture issues in a sheet, the distance be-

tween the rows being such that the flame from one pocket will commingle with that from the pocket immediately above it.

4. A gas burner having an air and gas mixer and a substantially vertical face provided with a plurality of transverse rows of perforations for the escape of the mixed gas and air, a lip secured at one side only to the face and covering each row of perforations, and forming with the face a pocket from which the mixture issues in a sheet, the distance between the rows being such that the flame from one pocket will commingle with that from the pocket immediately above it, the exposed surfaces of the lips and face being covered with wool asbestos.

In testimony whereof we affix our signatures in presence of two witnesses.

HENRY G. DAWSON.

WILLIAM R. DAWSON.

Witnesses:

SPENCER WARD,

LOUIS K. GILLSON.