(No Model.)

R. YOUNG.

FIRE PLACE FOR BURNING GASEOUS FUEL.

No. 409,765. Patented Aug. 27, 1889.

Fig. 1.

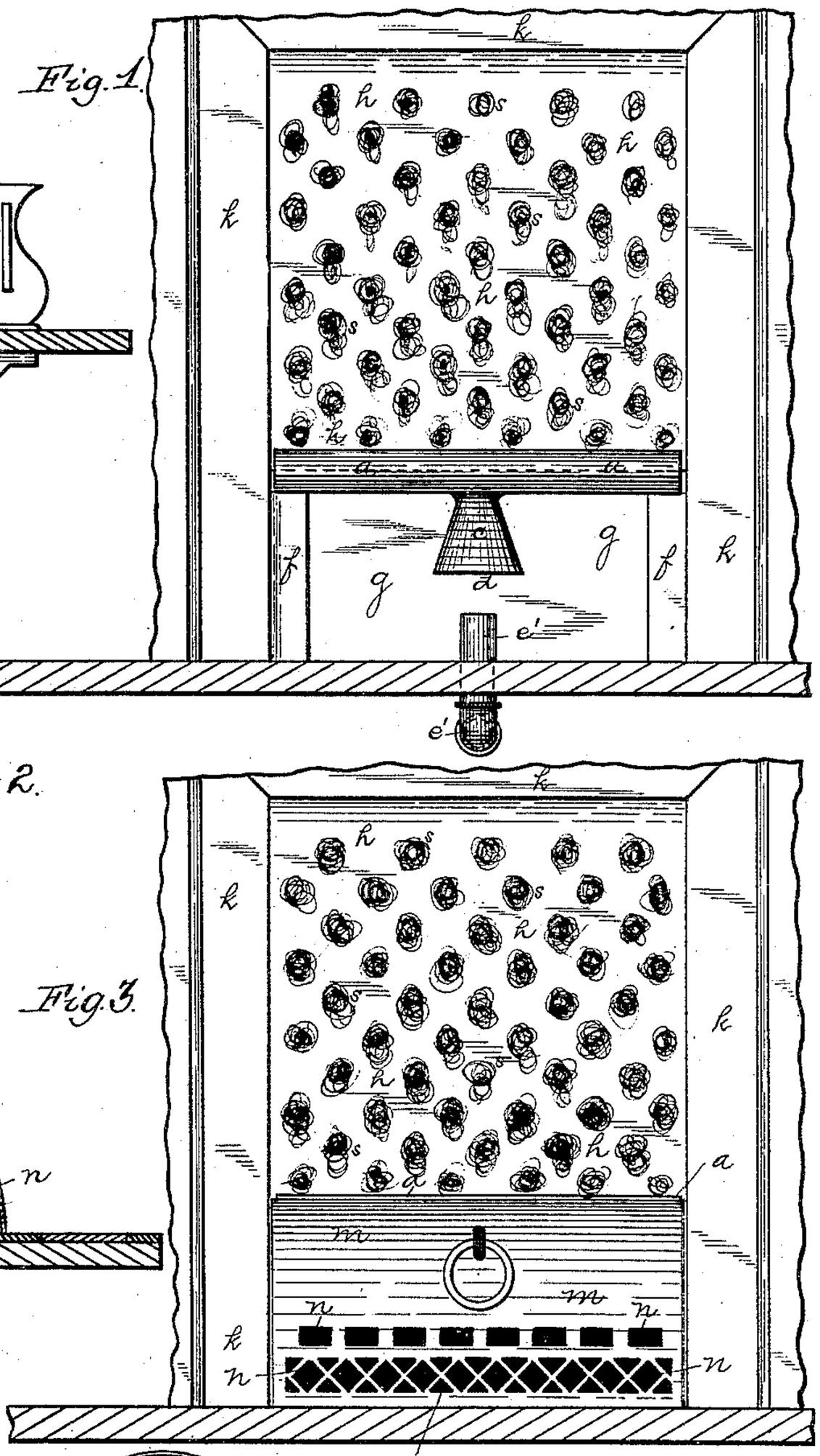


Fig. 2.

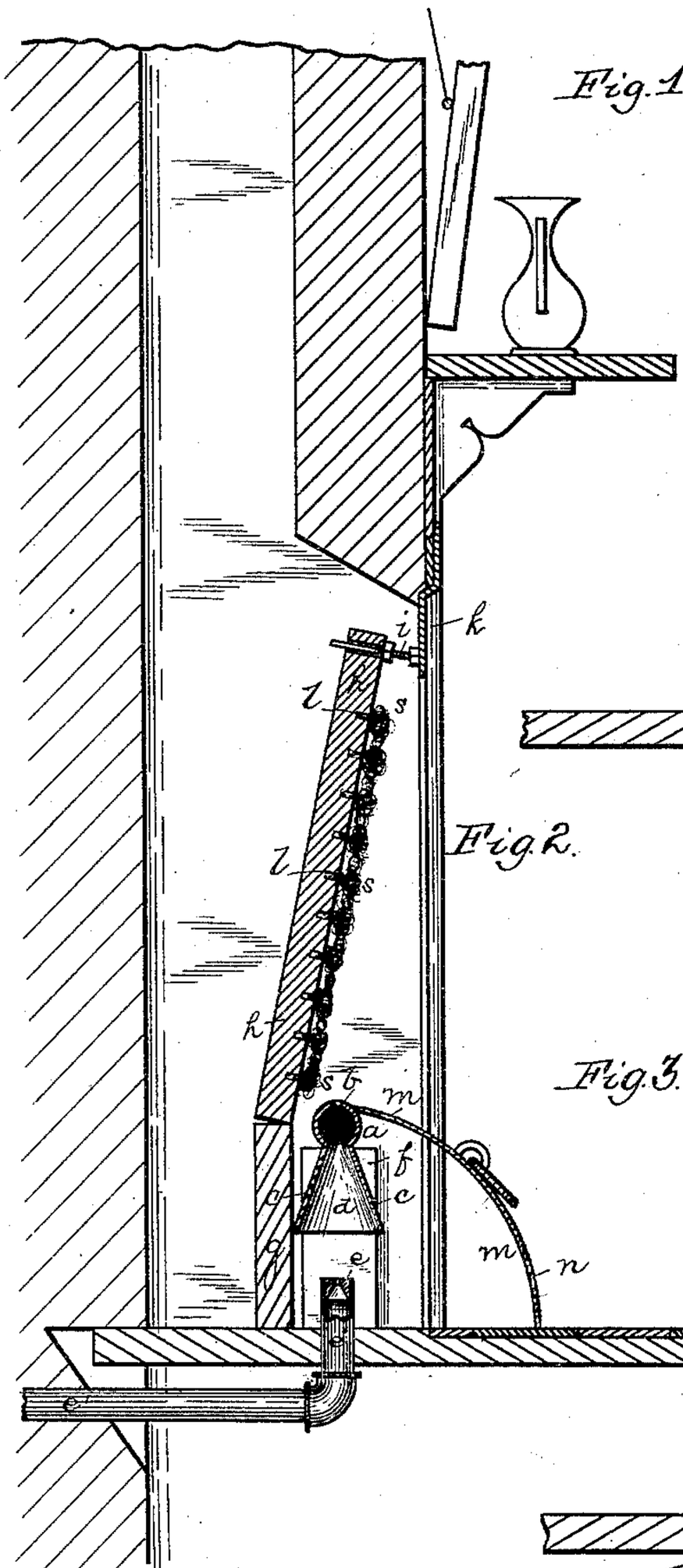
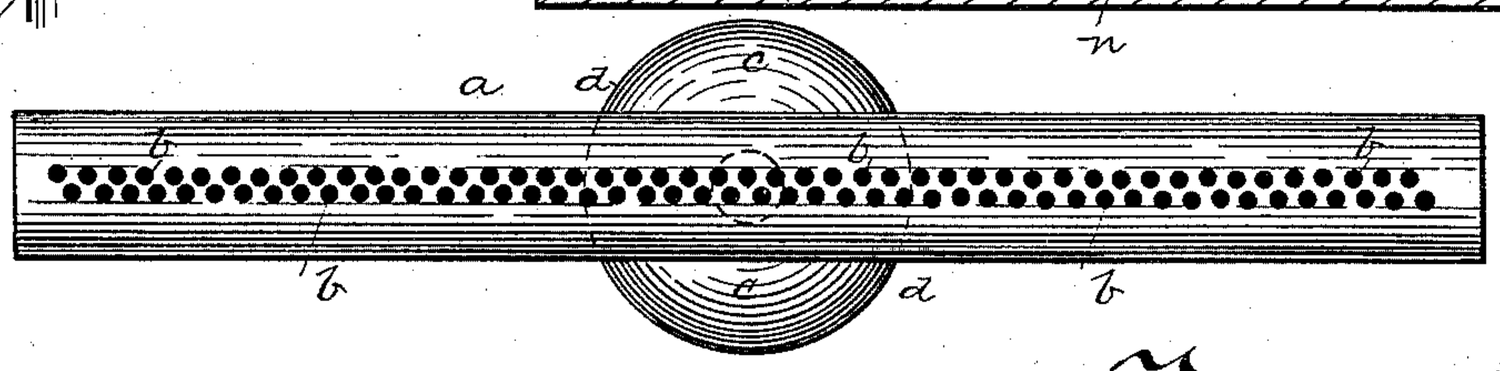


Fig. 3.

Fig. 4.



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UNITED STATES PATENT OFFICE.

ROBERT YOUNG, OF ALLEGHENY, PENNSYLVANIA.

FIRE-PLACE FOR BURNING GASEOUS FUEL.

SPECIFICATION forming part of Letters Patent No. 409,765, dated August 27, 1889.

Application filed February 13, 1889. Serial No. 299,718. (No model.)

To all whom it may concern:

Be it known that I, ROBERT YOUNG, a resident of Allegheny, in the county of Allegheny and State of Pennsylvania, have invented a new and useful Improvement in Fire-Places for Burning Gaseous Fuel; and I do hereby declare the following to be a full, clear, and exact description thereof.

My invention relates to fire-places for burning natural or other gaseous fuel, its object being to provide a burner and fire-place in which practically-perfect combustion of the gases may be obtained, and in which practically all the heat generated by the combustion of the gases can be quickly radiated into the apartment.

My invention has reference generally to the class of fire-places in which a burner is arranged at the base of a tile and the flame from the burner acts to heat this tile or asbestus or like substances supported thereon, and the heat is thus radiated into the apartment.

The special improvements forming the subject-matter of this application will be fully described in the specification and set forth in the claims.

To enable others skilled in the art to make and use my invention, I will describe the same more fully, referring to the accompanying drawings, in which—

Figure 1 is a face view of my improved fire-place. Fig. 2 is a longitudinal section thereof. Fig. 3 is a face view, the fender being in position, showing the appearance of the fire-place when in use; and Fig. 4 is an enlarged plan view of the burner and nipple of the gas-pipe, showing their position with relation to each other.

Like letters of reference indicate like parts in each.

In my improved fire-place I employ a burner the construction of which is shown in the drawings, the burner consisting of the body *a*, which is practically a tube supported in a horizontal position, said tube having a row or rows of perforations extending through the top wall of the burner, these perforations being of a particular size, according to the length of the burner, the amount of gas to be consumed, and the kind of gas employed, as it is found that to obtain the best heating effects the perforations must be changed according as natural or artificial gas is employed. I find that two rows of these perforations *b* give the best results, and that the perforations of one row should be placed between or alternate with those of the other row, as shown, the burner being so constructed in order that a practically-continuous flame may be obtained, as it is found that by employing a large number of holes placed in such positions the flame from the intermingled gas and air passing up through one hole or perforation will mingle with those adjoining said hole or perforation in the other row, and in this way a continuous sheet of flame along the top edge of the burner be obtained. Depending from this burner is a mixer *c*, which, as shown, has a large mouth, in order to permit the entrance of a large body of air and to give free entrance of all the air which can be affected by the jet of gas entering the mixer.

I find that the best results are obtained with a mixer of about the shape shown, flaring from its connection with the body *a*, with an even flare to the base thereof, and having a large mouth *d*. The gas-nipple *e*, secured to the gas-pipe *e'*, is preferably formed entirely separate from the mixer, and is placed a distance below the mouth or base thereof, the best results with natural gas being obtained where the nipple is arranged in about the position shown relative to the mixer, so that as the gas issues from the nipple it can intermingle with the air which is carried upwardly through the mixer, and a practically perfect mixture of the air and gas is obtained, and this in the best proportions for the perfect combustion of the gas. When so arranged, I find from practical use that a very small jet or stream of gas is sufficient to obtain a strong heating-flame from the burner, while if the nipple is placed directly within the mixing-chamber a greater proportion of gas is required and the flame formed is white and smoky. By my construction and arrangement of the nipple and mixer, however, I obtain such an intermingling of the gas and air that, instead of the flame being stronger in the middle portion of the burner above the mixing-chamber, it is practically even through-

out the length of the burner, and a clear flame free from smoke is obtained, this flame having exceedingly high heating properties.

In building up my improved fire-place I find it best to bring the burner nearer to the front of the fire-place than is customary where an ordinary grate is employed, and I generally support the burner-body on bricks or blocks at each end, as at *f*, the proper height for the burner being easily adjusted on such blocks, according to the height of the nipple of the gas-pipe from the hearth. Back of and close to the burner I place the tile *g*, which extends up from the hearth about level with the top of the burner, and resting on this tile and supported on an inclined position extending over the burner is the tile *h*, this tile having generally a bolt or like adjusting device *i*, passing through the same at the upper end, which bolt rests against the inner face of the front plate *k* of the fire-place and regulates the space between the face of the tile and the back of the front plate *k*, through which the products of combustion pass to the chimney, only a small space being left for the escape of such products, which is sufficient to carry off the same without permitting such a draft as will affect the burning of the gases. The tile *h* can thus be acurately adjusted, so as to arrange it at a proper incline and bring its face above the burner, so that the flame therefrom can play upwardly upon its face.

In order to obtain the highest heating properties from the burning of the gases, I generally form in the tile at intervals on its face a series of seats or holes *l*, these seats or holes being filled with asbestus wool or fiber, which is forced into the holes in such way that part thereof extends out in tufts *s* beyond the surface of the tile in such position that the flame and heated products can circulate around the tufts of asbestus and raise the same to high heat and incandescence, while, as the tile is not entirely covered with this asbestus, the heat absorbed by the tufts, as well as that absorbed by the tile, is radiated outwardly into the apartment, and on account of the inclined position of the tile the heat is not only radiated outwardly but downwardly, so as to distribute it into the apartment and obtain practically all the benefits from the heat generated.

Instead of the tufted tile, as above described, I may employ a tile formed entirely of asbestus, or may, if desired, employ a corrugated enameled tile, which will act to reflect the heat generated into the apartment; but I find the best results are obtained from the tile having the tufts of asbestus arranged at intervals thereon. The tile may be colored in any desired way, so as to increase the effect of the burning of the gases, and red, black, or other colored tile being employed.

In order to prevent the air from passing around the front of the burner, to cover up the body thereof and the nipple, and to reflect the heat into the apartment, I employ an ornamental fender *m*, which is generally arranged in the position shown in the drawings, its upper edge resting against the body of the burner, near the top thereof, so that only a small portion of the body of the burner is exposed to view, and then extending downwardly to the front of the fire-place and resting on the hearth. This fender is provided with a series of openings *n* near the base thereof to permit the free entrance of the air, so that it may pass into the chamber formed between the fender and the hearth, and then enter the mixing chamber *c*, while as the fender rests on the body of the burner it will permit but little of the air to pass from below the fender around the body of the burner to the series of perforations along the top thereof, so compelling practically all the air consumed to pass upwardly through the burner. The fender is preferably curved in shape, as shown, and may be formed of ornamental brass-work or polished enameled iron, or other material having a polished surface proper to reflect the heat and light into the room.

My improved burner may be placed within an ordinary fire-place, it only being necessary to lift out the grate, place the base-tile *g* a proper distance from the base of the fire-front *k*, secure the nipple *e* within the gas-pipe where it enters through the hearth, support on the burner in proper position and at the proper height above the nipple, so that there will be a proper space between the base of the mixing-chamber *c* and the nipple, arrange the tile *h* in position on the tile *g*, and regulate the space between the top of the tile and the back of the fire-front *k* by means of the bolt *i*, and place the fender *m* in position against the burner, all the parts being secured in position without any alteration of the lining of the grate, and being removable, so that they can be quickly taken out and the ordinary grate substituted.

The parts employed are not expensive and the cost of putting it in place is but little.

When in use, the small jet or stream of gas from the nipple *e* passes upwardly into the enlarged mouth of the mixing-chamber *c*, and in passing from the nipple up into and through the mixing-chamber it is thoroughly intermingled with the air, and a proper mixture of gas and air is obtained, so that there is a practically-perfect combustion of the same along the top edge of the burner, and as the rows of perforations thereon are close to each other, and the holes alternate, as above described, in the two rows of perforations, a practically-continuous flame is obtained from one end to the other of the burner. This flame as it issues comes in contact with and plays upwardly upon the face of the inclined tile *h* and quickly heats up the tufts of asbestus supported thereon, so that the asbestus becomes incandescent, and practically all the heat from the combustion of the gas is taken up by the asbestus, and in turn radiated outwardly into the room therefrom by the tile

back of it. At the same time, as part of the heat and light will strike against the fender *m*, the heat and light are also reflected into the room thereby, and the effect obtained is pleasing to the eye, a bright and ever-changing appearance being imparted to the fire-place as the flame plays in and around the tufts of asbestus on the tile backing, and the effect being much brighter and more pleasing than the ordinary monotonous burning of gas within a mass of fire-brick or like material. As the asbestus tufting is raised to a high heat and incandescence as soon as the gas is ignited, it is evident that pratically all the heat generated by the gas is immediately radiated into the apartment, and the heating effects are obtained much more quickly than in the ordinary gas-grate, and it is found by practical tests that by my improved fire-place I am enabled to obtain the same heat effect by the consumption of less than one-half the volume of gas.

What I claim as my invention, and desire to secure by Letters Patent, is—

1. In a fire-place, the combination of a horizontal burner having a row or rows of perforations in the top wall thereof, an inclined tile extending from the back of and upwardly over the burner, and a fender extending from the burner-body to the hearth and having perforations therein to permit the passage of air to the burner, substantially as and for the purposes set forth.

2. In a fire-place, the combination of the brick tile *g*, the horizontal burner *a* in front of the same, supported on blocks *f*, the inclined tile *h*, resting upon the tile *g* and extending outwardly over the burner, and the fender *m*, extending from the burner to the hearth and having perforations therein, substantially as and for the purposes set forth.

In testimony whereof I, the said ROBERT YOUNG, have hereunto set my hand.

ROBERT YOUNG.

Witnesses:
J. N. COOKE,
ROBT. D. TOTTEN.