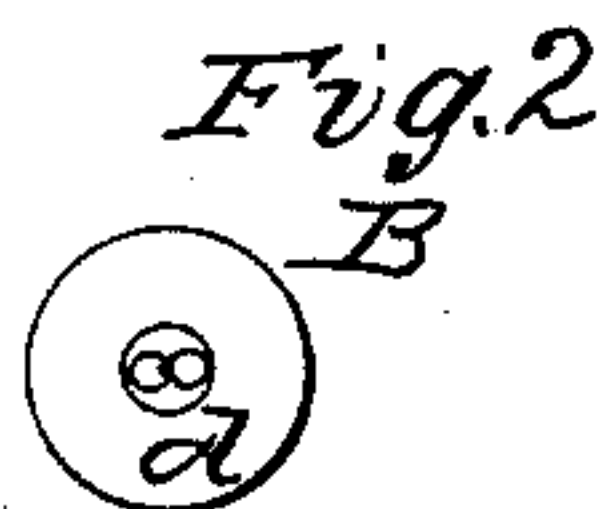
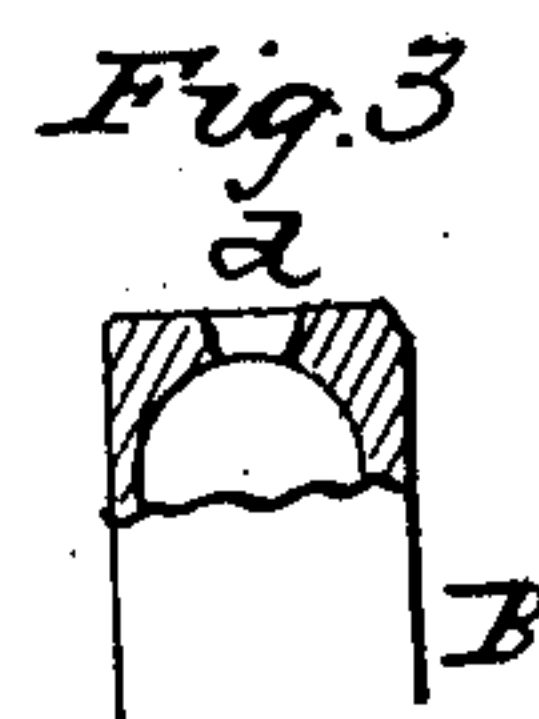
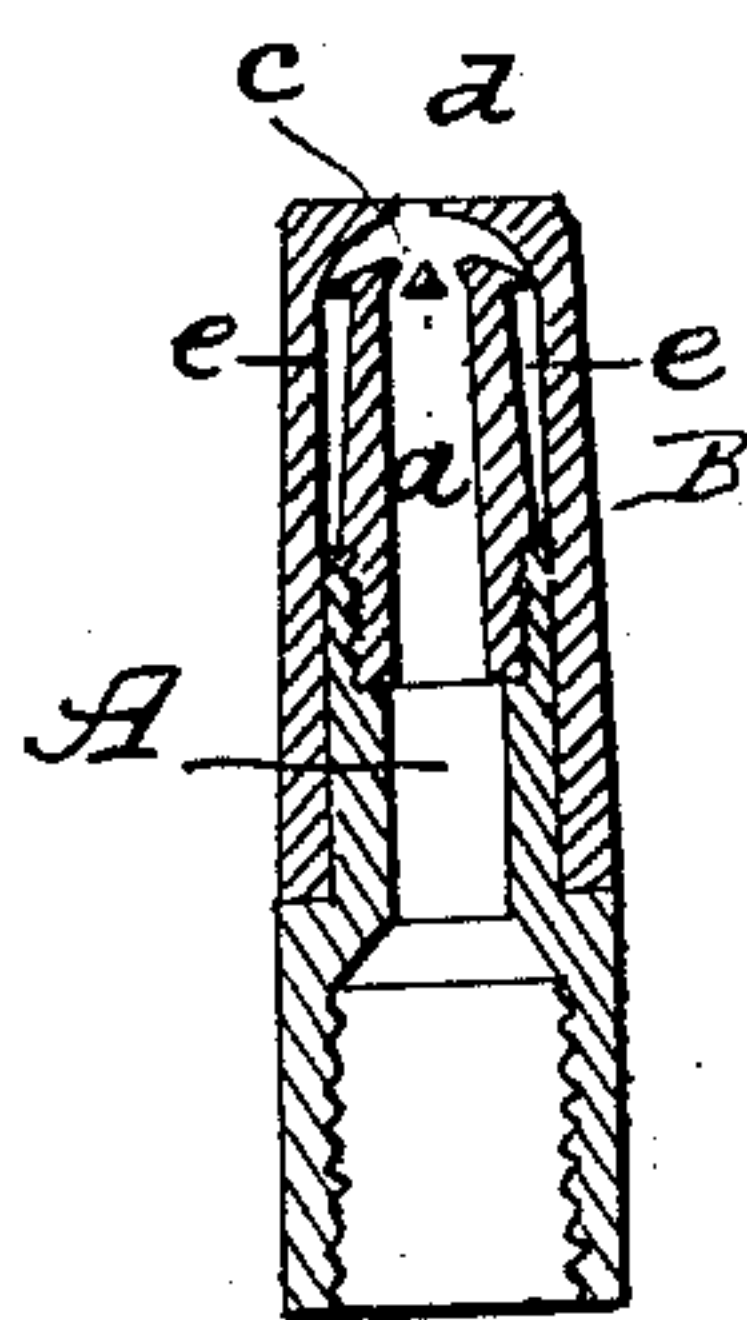


L. E. HICKS.

Gas Burner.

No. 21,497.

Patented Sept. 14, 1858.



UNITED STATES PATENT OFFICE.

LUCIEN E. HICKS, OF NEW YORK, N. Y.

GAS-BURNER.

Specification of Letters Patent No. 21,497, dated September 14, 1858.

To all whom it may concern:

Be it known that I, LUCIEN E. HICKS, of the city, county, and State of New York, have invented a new and useful Improvement in Gas-Burners; and I do hereby declare that the following is a full, clear, and exact description of the same, reference being had to the accompanying drawings, forming part of this specification, in which—

Figure 1 is a central section of a burner with my improvement applied. Fig. 2 is a top view of the same.

Similar letters of reference denote like parts in both figures.

In the construction of gas burners which have caps made with a crown, concave internally, applied to them, my invention consists in making the outer surface of the crown of the cap flat or nearly flat and the orifice through which the gas escapes of circular form horizontally and with its edge curved in the path of two vertical circles as delineated in the sectional view of the drawing, for the purpose hereinafter specified.

To enable others to make and use my invention, I will proceed to describe its construction and operation.

A, is a burner of the kind known as the "fish-tail", made with what is known as the "Scotch tip" *a*, but this kind of tip is not necessary to the success of my invention, which is applicable to the same kind of burner having its tip of the same piece of metal as the rest of the burner.

B, is the cap whose combination with the fishtail burner constitutes my invention. This cap may be of cast iron or other metal and fits snugly to the lower part of the sides of the burner to which it may be attached by screwing on, though it answers equally well when made to fit snugly and to rest in the manner represented in Fig. 1, upon a shoulder *b*, on the burner which keeps the interior of the crown at a proper distance above the tip of the burner. The interior of the crown of this cap is made concave as shown in Fig. 1, and its distance from the head of the tip at the highest should be about a sixteenth or one twentieth part of an inch, and thus a very shallow chamber *c*, is made between the said crown and the head of the tip. In the center of the crown of the cap, there is formed a circular orifice *d*, whose margin is slightly rounded on the ex-

terior, but the remainder of the exterior of the crown should be flat altogether or for a considerable distance from the margin of the orifice. The diameter of the orifice *d*, should be about one tenth or one-eighth of an inch or such that the edges of the sheet of gas formed by the two impinging jets issuing from the holes in the tip shall just strike or as it were graze its margin. The thickness of the crown of the cap at the margin of the orifice should be about one thirty-second part of an inch. A carefully conducted series of experiments with several of these caps shows it to be of importance that in a burner of ordinary size something very near the above dimensions should be adhered to, as any considerable departure therefrom gives a greatly inferior result.

When the burner is made with a Scotch tip, there will be a small cavity *e*, formed between the sides of the tip and the interior of the cap as shown at Fig. 1; but when the tip is made a part of the same metal as the other part of the burner, and the burner is of the usual form of burners so constructed, the cavity *e*, will be much less, but I do not regard such cavity of any importance to the success of my invention.

When the cap B is applied to a fishtail burner, a most extraordinary effect is produced. The sheet of flame, though not altered or materially altered in shape, is increased considerably, both in height and width and very materially so in thickness, and the increased volume of light is very apparent. This effect I have tried to account for by various theories, without having satisfied myself perfectly as to its cause; but the greatly increased thickness of the flame seems to show that the gas is expanded between the orifices in the tip of the burner and the orifice of the cap. Much depends on the form of the exterior of the cap, as if the margin of the orifice *d* is not rounded off or beveled and the surrounding portion of the surface flat or very nearly so, the same effect is not produced. One remarkable feature in the operation is that a very low pressure of gas on the burner is absolutely necessary to its success, and hence it is obvious that the result is not due to an increased consumption of gas, and all my experiments prove that a very great economy in gas is effected.

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

In the construction of gas burners which have caps made with a crown, concave internally, applied to them, making the outer surface of the crown of the cap flat or nearly flat, and the orifice *d*, through which the gas escapes, of circular form horizon-

tally, and with its edge curved in the path of two vertical circles as delineated in the sectional view of the drawing, for the purposes set forth. 10

L. E. HICKS.

Witnesses:

WM. TUSCH,
HENRY T. BROWN.