

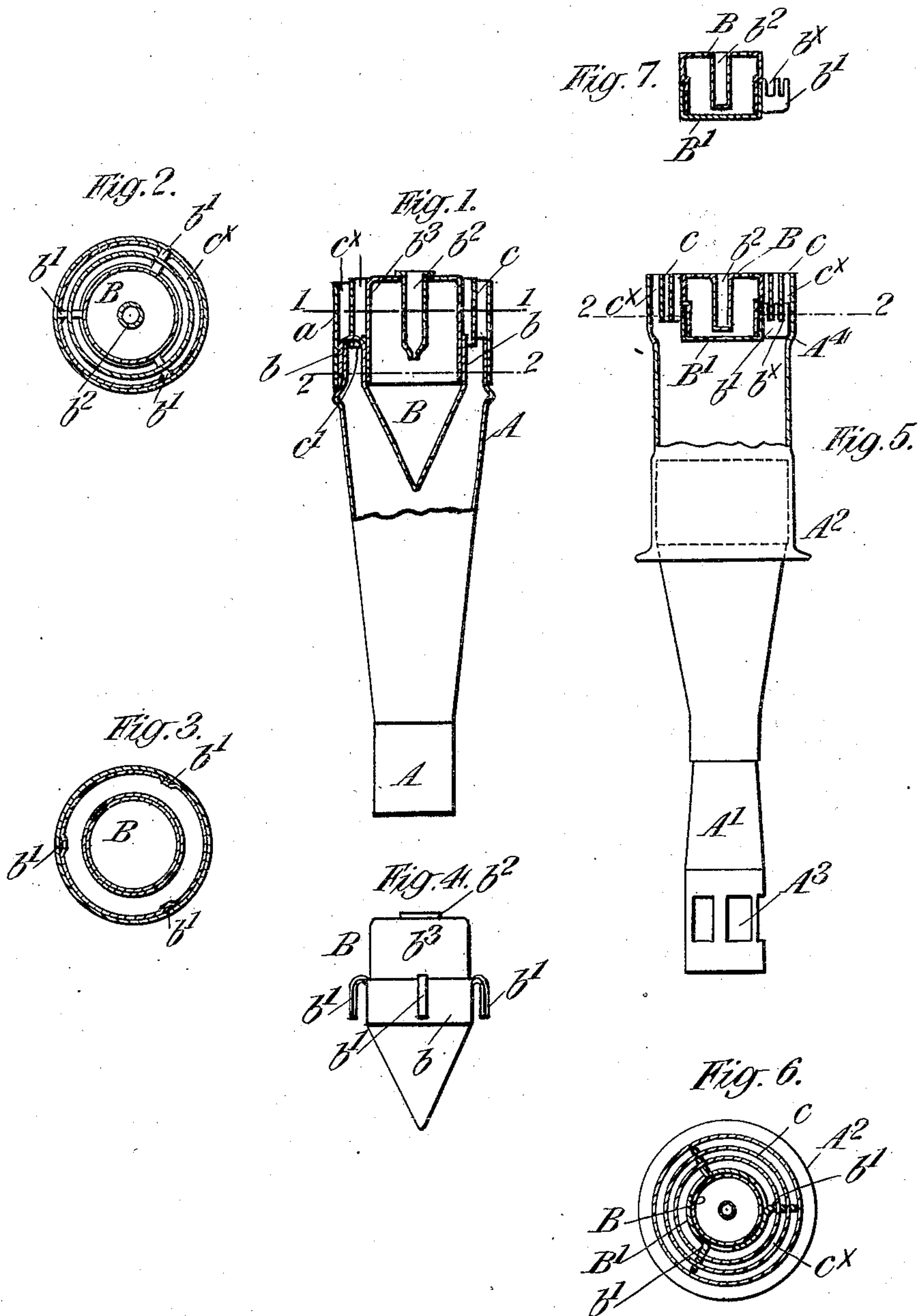
No. 896,533.

PATENTED AUG. 18, 1908.

C. W. HARRISON & A. C. NOAD.
INCANDESCENT GAS BURNER.

APPLICATION FILED NOV. 23, 1906.

2 SHEETS—SHEET 1.



Witnesses:

[Signature]
[Signature]

Inventors
Clark W. Harrison
Arthur C. Noad

By *[Signature]*
James L. Norris
[Signature]

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Fig. 8.

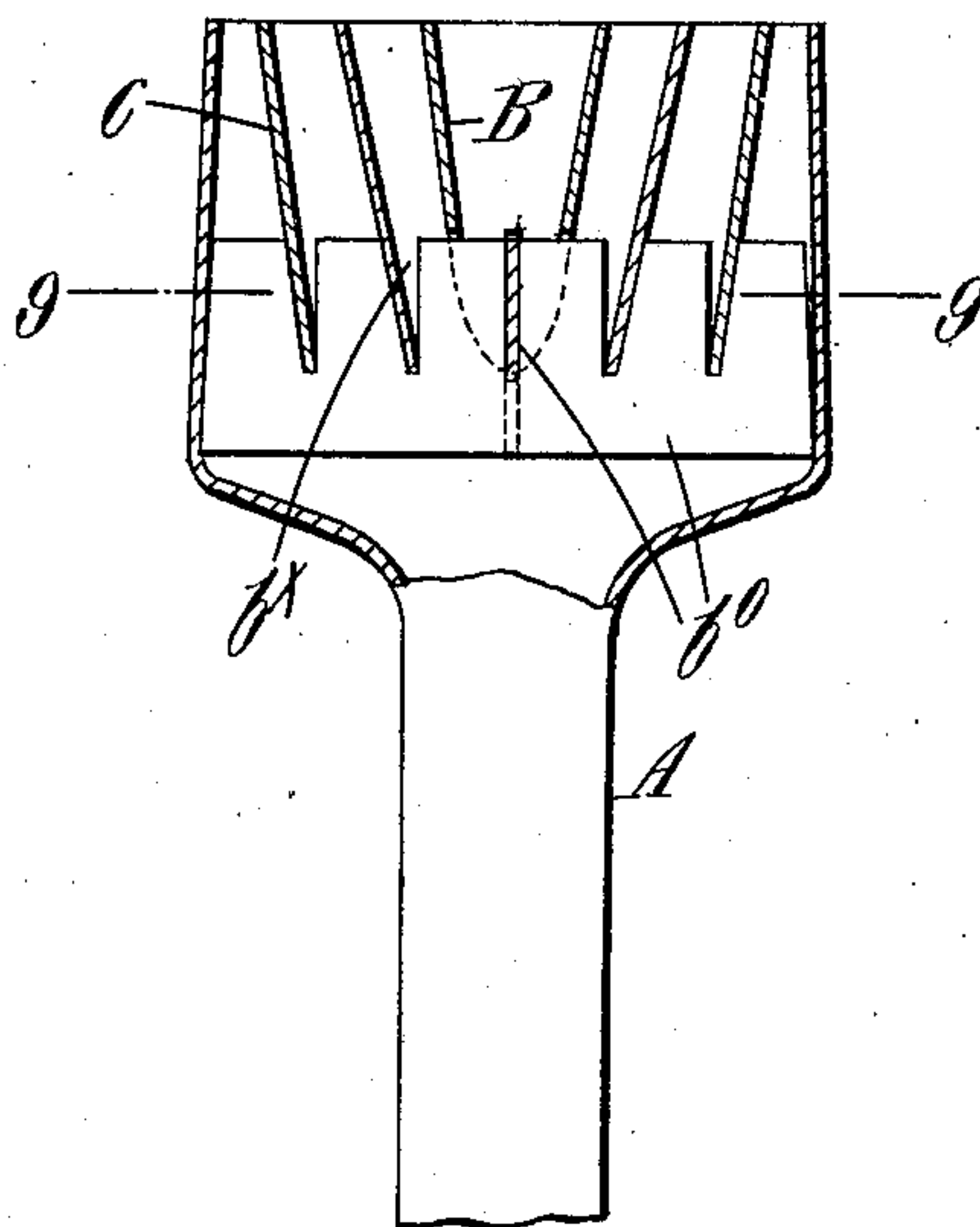
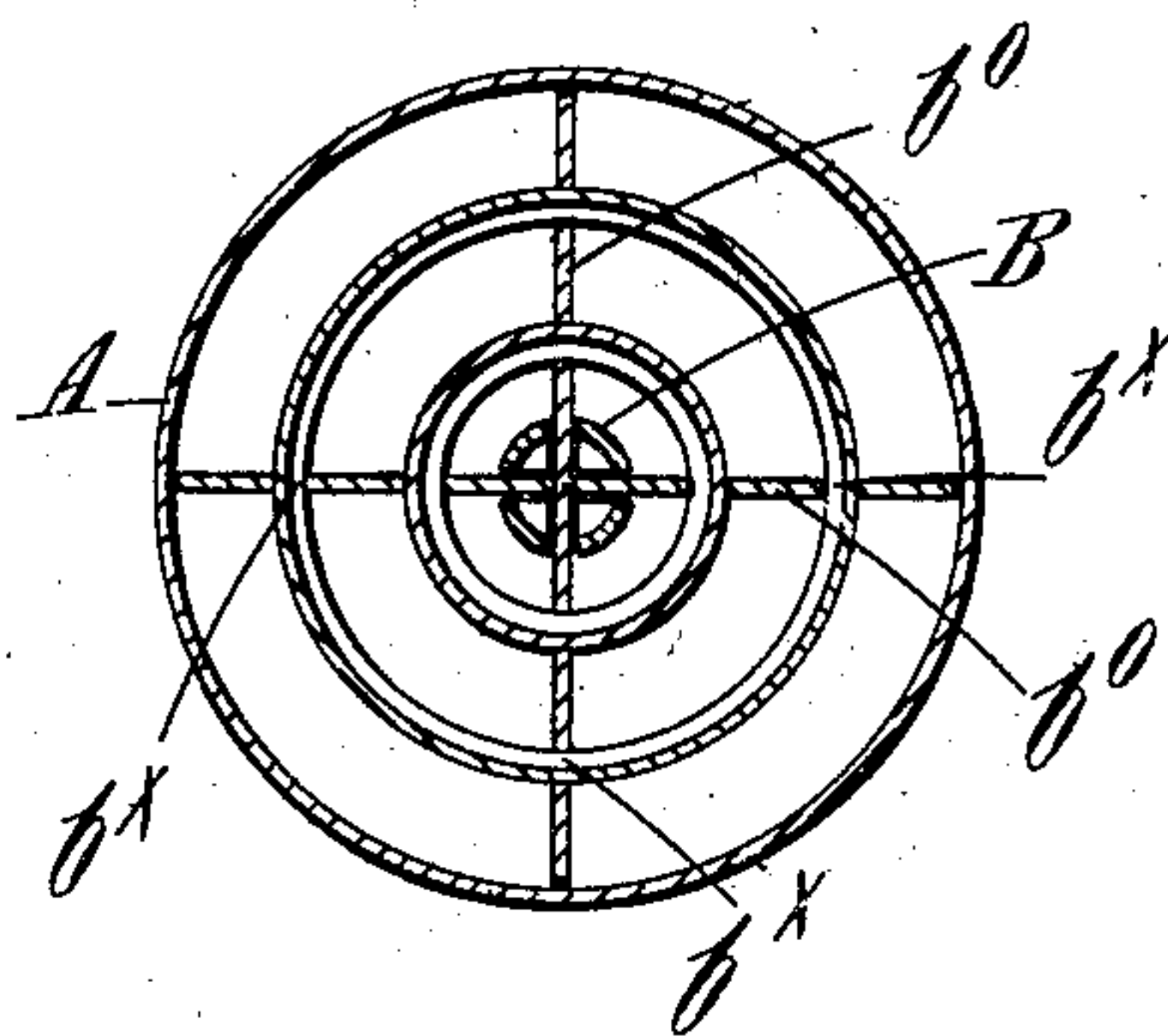


Fig. 9.



Witnesses:

J. B. Keeler

C. E. Kesler

Inventors

Clark Way Harrison

Arthur C. Noad

By

James L. Norris.

Attest

UNITED STATES PATENT OFFICE.

CLARK WAY HARRISON AND ARTHUR CUMMING NOAD, OF FULHAM, LONDON, ENGLAND;
SAID NOAD ASSIGNOR TO SAID HARRISON.

INCANDESCENT GAS-BURNER.

No. 896,533.

Specification of Letters Patent.

Patented Aug. 18, 1908.

Application filed November 23, 1906. Serial No. 344,756.

To all whom it may concern:

Be it known that we, CLARK WAY HARRISON, engineer, and ARTHUR CUMMING NOAD, gas-engineer, citizens of the United States of America, residing, respectively, at 96 Middlesex street and 12 Buer road, Fulham, both in the county of London, England, have invented certain new and useful Improvements Relating to Incandescence Gas-Burners, of which the following is a specification.

This invention has reference to gas burners of the Bunsen type, particularly those which are used for incandescence gas lamps and which are provided with gas deflecting devices situated concentrically within the mouth of the burner so as to form a narrow annular orifice or space for the escape of the gaseous mixture.

The annular space at the mouth of the burner has sometimes been made very narrow so as to avoid the use of the wire gauze or perforated plates generally employed for preventing "lighting back", with the result that an insufficient amount of the gaseous mixture passes through said restricted space to produce a flame sufficiently high to properly fill a large incandescence mantle under the ordinary gas pressure.

It is the chief object of our invention to so construct the burner that the area of the annular space can be increased so as to avoid an unduly restricted outlet and yet enable the usual wire gauze or perforated plates for preventing "lighting back" to be dispensed with. For this purpose the said annular space is made comparatively wide and preferably of considerable length, and divided into two or more concentric annular orifices or passages by means of one or more rings or tubes inserted into said comparatively wide annular space.

In some cases we make the gas deflecting device with a circular or cylindrical upper portion which gradually diminishes in diameter downwardly without any abrupt alteration in its shape to a point where the gas impinges upon it; an inverted cone with a prolonged cylindrical upper portion of less diameter than the mouth of the burner tube is very appropriate for our purpose. We do not however desire to limit ourselves to the use of a gas deflecting device of this character.

In order that our said invention may be clearly understood and readily carried into

effect we will describe the same more fully with reference to the accompanying drawings, in which:—

Figure 1 is a vertical section of one form of burner constructed in accordance with our invention. Figs. 2 and 3 are cross sections on the lines 1, 1, and 2, 2, of Fig. 1. Fig. 4 is an elevation of the gas deflecting device employed with this burner. Fig. 5 is a sectional elevation of a modified construction of the burner. Fig. 6 is a horizontal section on the line 2—2 of Fig. 5, and Fig. 7 is a vertical section of the gas deflecting device employed with this burner. Fig. 8 is a sectional elevation of a further modified construction of the burner, and Fig. 9 is a sectional plan on the line 9—9 of Fig. 8.

Like letters of reference indicate similar parts in all the figures.

Referring more particularly to Figs. 1 to 4, A is the burner tube at or near the upper end of which the gas deflecting device B is situated. This device is shown in the form of an inverted cone having a cylindrical upper portion *b* of smaller diameter than the internal diameter of the mouth of the burner-tube so as to leave an annular space at said mouth. This cone is preferably hollow and is arranged concentrically within the burner tube; it is, in the example shown, held in place by means of bent pieces or tongues *b'* forming an integral part of the device and engaging with the burner tube; it is also furnished with a central socket *b²* for the reception of the crutch employed for supporting the mantle. The upper cylindrical end of the cone is lengthened by a tubular prolongation *b³* thereon and the mouth of the burner is also similarly prolonged by a tubular prolongation *a*, thus leaving a comparatively long and unobstructed annular space or passage between the said burner tube and the cylindrical portion of the cone. Into this space or passage are introduced one or more of the concentric tubes *c* which have the effect of dividing the annular space or passage into a number of concentric annular orifices *c^x* for the escape of the gaseous mixture from the burner. These tubes may be supported in place by having notches *c'* cut in their lower or inner ends for resting upon or otherwise engaging with the pieces or tongues *b'* of the cone; or they may be otherwise held in place. It is important to make said retaining pieces *b'* or

their equivalents as narrow as practicable so as to avoid unduly obstructing the flow of the gaseous mixture to the mouth of the burner. Although we have above referred to the prolongation of the gas deflecting device and the burner tube as being cylindrical, the said prolongations may be tapered either inwardly or outwardly so long as they are parallel or approximately parallel. By the use of the aforesaid tubes *c* the said comparatively wide annular space is divided into a number of narrow annular passages each of which is sufficiently narrow and long to prevent "lighting back", but in the aggregate they provide an area of sufficient size for enabling a flame of the requisite height to be obtained for filling the interior of a large mantle.

A less satisfactory although equally practicable result may be attained by dispensing with the aforesaid cylindrical prolongation of the gas deflecting device and of the burner tube and introducing into the annular space between the gas deflecting device and the burner tube one or more rings or tubes. If tubes be employed they may in this instance be of tapered shape to more or less conform to the gas deflecting device. Such construction is shown in Figs. 8 and 9 in which the conical tubes or rings *c* are lodged in notches *b^x* in thin diametrically situated plates *b^o*. The apex of the conical deflector *B* is formed with two incisions at right angles to one another and the thin plates *b^o* fit into these incisions and thus hold the deflector *B* in position.

Referring now to Figs. 5, 6 and 7 which illustrate a modified form wherein the aforesaid conical gas deflecting device is omitted and the rings *c* are held in position by means somewhat different to those disclosed with respect to the preceding form. In this case the rings *c* are held in position by being placed in notches *b^x* in the forked lugs or tongues *b'* which latter are in the example shown formed by bending outwards two or more portions of the cup *B'* comprising the lower portion of the deflecting device *B*. The deflecting device *B* and rings *c* will then be supported by the engagement of the tongues *b'* with a ledge *A⁴* of the burner tube *A*. In this form it has been found important that the said passages should be not less than one eighth of an inch in depth and not more than one eighth of an inch in width. A spiral piece of metal may be employed in place of the rings *c*, the object in all cases being to divide the large annular space into smaller passages of considerable depth and of comparatively small width so as to prevent "lighting back" without using wire gauze or other device, for that purpose.

We are aware that it has before been proposed to provide a gas burner with an annular passage or passages at the mouth thereof but

in such cases the annular space or spaces have been considerably obstructed by the introduction of metal strips arranged to subdivide the said space or spaces; one defect of such arrangement is that the flow of gas is broken up and considerably obstructed, whereas according to our invention practically unbroken or unobstructed annular passages for the gas are provided, and an unbroken cylindrical flame is thereby attained. —What we claim and desire to secure by Letters Patent of the United States is:—

1. In a gas burner, the combination of a burner tube, a gas deflecting device centrally situated within said tube and adapted to leave a comparatively wide and deep annular space between its outer wall and the wall of the burner tube, means for dividing said annular space into narrow deep unobstructed annular passages for enabling the gas to pass to the burner mouth in unbroken cylindrical streams, and means located below the level of the burner mouth for supporting the first mentioned means.

2. In a gas burner, the combination of a burner tube, a centrally-situated gas deflecting device of which the lower portion gradually diminishes in size without any abrupt alteration in its shape to a point where the gas jet impinges upon it, an upward prolongation on said device to form a comparatively wide and deep annular passage, independent means for dividing said annular space into narrow deep unobstructed annular passages, enabling the gas to pass to the burner mouth in unbroken cylindrical streams, and means located below the level of the burner mouth for supporting the first mentioned means.

3. In a gas burner, the combination of a burner tube, a device centrally situated within said tube and adapted to leave a comparatively wide and deep annular space between its outer wall and the wall of the burner tube, means for dividing said annular space into narrow deep unobstructed annular passages, and tongues on said device for supporting the latter and also the aforesaid means for dividing said annular passage, for the purpose specified.

4. In a gas burner, the combination of a burner tube, a centrally-situated gas deflecting device of which the lower portion gradually diminishes in size without any abrupt alteration in its shape to a point where the gas jet impinges upon it, an upward prolongation on said device to form a comparatively wide and deep annular passage, and means for dividing said annular space into narrow deep unobstructed annular passages, and tongues on said device for supporting the latter and also the aforesaid means for dividing said annular passage, for the purpose specified.

5. In a gas burner, the combination of a burner tube, a gas deflecting device centrally

situated within said tube and adapted to leave a comparatively wide and deep annular space between its outer wall and the wall of the burner tube, and a plurality of removable concentric rings for dividing said annular passage into narrow deep unobstructed annular passages for the purpose specified.

6. In a gas burner the combination of a burner tube, a centrally-situated gas deflecting device of which the lower portion gradually diminishes in size without any abrupt alteration in its shape to a point where the gas jet impinges upon it, an upward prolongation on said device to form a comparatively wide and deep annular passage, and a plurality of removable concentric rings for dividing said annular passage into narrow, deep, unobstructed annular passages.

7. In a gas burner, the combination of a burner tube, a gas deflecting device centrally-situated within said tube and adapted to leave a comparatively wide and deep annular space between its outer wall and the wall of the burner tube, a plurality of concentric rings for dividing said annular passage into narrow, deep, annular unobstructed passages, and tongues on said device for supporting the latter and also the aforesaid means for dividing said annular passage, for the purpose specified.

8. In a gas burner, the combination of a burner tube, a centrally-situated gas deflecting device of which the lower portion gradually diminishes in size without any abrupt alteration in its shape to a point where the gas jet impinges upon it, an upward prolongation on said device to form a comparatively wide and deep annular passage a plurality of concentric rings for dividing said annular passage into narrow, deep, annular unobstructed passages, and tongues on said device for supporting the latter and also the aforesaid means for dividing said annular passage, for the purpose specified.

9. In a gas burner the combination of a burner tube, a gas deflecting device centrally-situated within said tube and adapted to leave a comparatively wide and deep annular space between its outer wall and the wall of the burner tube, means for dividing said annular space into narrow deep unobstructed annular passages and tongues formed by bending outwards integral portions of said device for supporting the latter and also the

aforesaid means for dividing said annular passage for the purpose specified.

10. In a gas burner, the combination of a burner tube, a centrally-situated gas deflecting device of which the lower portion gradually diminishes in size without any abrupt alteration in its shape to a point where the gas jet impinges upon it, an upward prolongation on said device to form a comparatively wide and deep annular passage, means for dividing said annular space into narrow deep unobstructed annular passages, and tongues formed by bending outwards integral portions of said deflecting device for supporting the latter and also the aforesaid means for dividing said annular passage for the purpose specified.

11. In a gas burner the combination of a burner tube, a gas deflecting device centrally-situated within said tube and adapted to leave a comparatively wide and deep annular space between its outer wall and the wall of the burner tube, means for dividing said annular space into narrow deep unobstructed annular passages, tongues formed by bending outwards integral portions of said device for supporting the latter and also the said means for dividing said annular passage, and notches in said tongues to hold in position the aforesaid means for the purpose specified.

12. In a gas burner, the combination of a burner tube, a centrally-situated gas deflecting device of which the lower portion gradually diminishes in size without any abrupt alteration in its shape to a point where the gas jet impinges upon it, an upward prolongation on said device to form a comparatively wide and deep annular passage, means for dividing said annular space into narrow deep unobstructed annular passages, tongues formed by bending outwards integral portions of said deflecting device for supporting the latter and also the said means for dividing said annular passage, and notches in said tongues to hold in position the aforesaid means for the purpose specified.

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

CLARK WAY HARRISON.
ARTHUR CUMMING NOAD.

Witnesses:

T. SELBY WARDLE,
CHAS. S. RUTLIDGE.