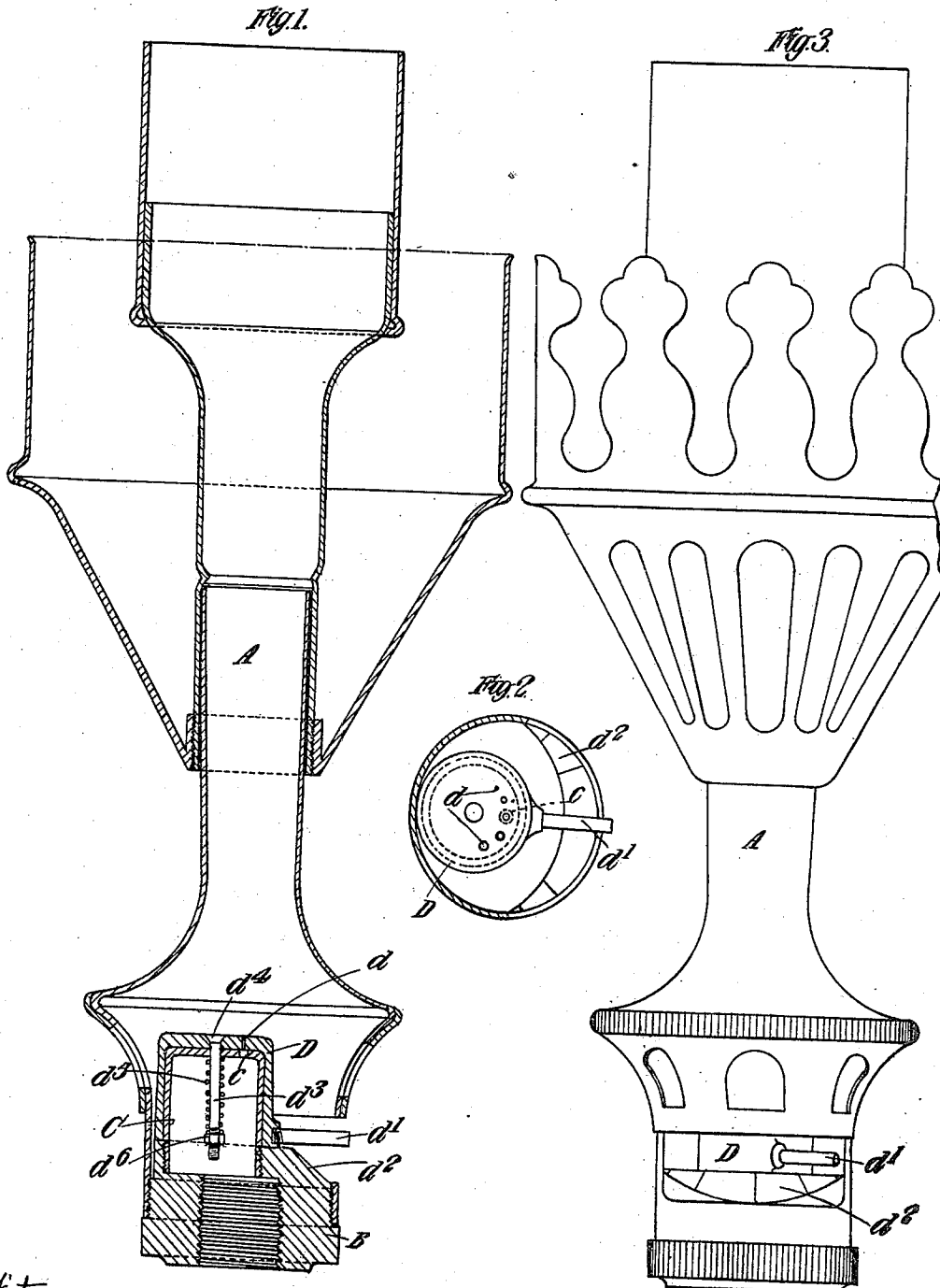


C. W. HARRISON & A. C. NOAD.
 GAS REGULATOR.
 APPLICATION FILED OCT. 22, 1907.

987,459.

Patented Mar. 21, 1911.
 2 SHEETS—SHEET 1.



Witnesses
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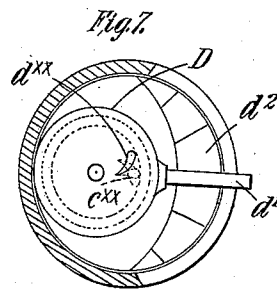
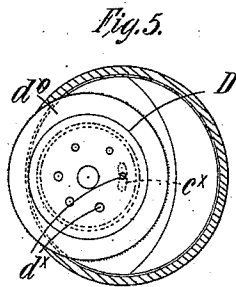
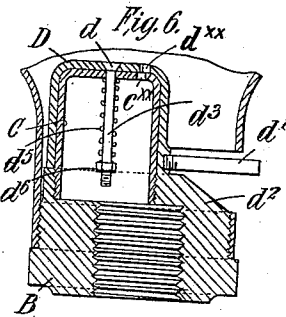
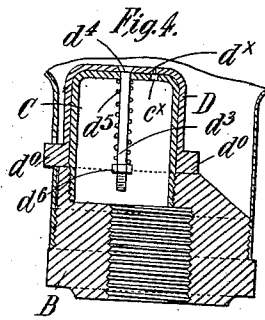
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2 SHEETS—SHEET 2.



Witnesses
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UNITED STATES PATENT OFFICE.

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

GAS-REGULATOR.

987,459.

Specification of Letters Patent. Patented Mar. 21, 1911.

Application filed October 22, 1907. Serial No. 398,654.

To all whom it may concern:

Be it known that we, CLARK WAY HARRISON and ARTHUR CUMMING NOAD, both 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 Gas-Regulators, of which the following is a specification.

15 This invention relates to gas regulating devices for use with Bunsen burners, the said regulating devices being of the kind in which the gas passes through one or more orifices forming part of the gas nozzle.

20 The regulation of the gas has in some cases been attempted by forming the nozzle with several orifices through which the gas issues simultaneously and by providing means for closing some of the orifices and thereby regulating the quantity of gas supplied to the burner in accordance with the number of orifices remaining open. Better results have however, we believe, been obtained by the use of a nozzle having a single centrally situated gas orifice, whose area is regulated by contracting or expanding the same, or by partly obstructing the flow of gas through said orifice by means of a needle valve. An objection to the latter arrangement, however, is that, since the orifice does not present a plain unobstructed hole for the flow of the gas, considerable friction is produced and the stream of gas as it issues, instead of continuing as a jet, becomes too quickly diffused. For this reason the practice of employing removable nozzles having orifices of varying dimensions, and of removing one nozzle and replacing it by another having an orifice of different size, is often resorted to because such a method insures that the jet of gas shall always be unobstructed and also enter the burner centrally.

45 The chief object of the present invention is to enable the advantages mentioned above with respect to the interchangeable nozzles to be obtained without the necessity of interchanging them.

50 According to our invention the gas regulating device comprises a nozzle having a gas orifice which is situated centrally or approximately centrally with respect to the longitudinal axis of the burner, and an adjustable piece or member adapted to move about an axis eccentric with respect to the

gas orifice and having apertures of varying size any of which are capable of being brought into coincidence with the said gas orifice by shifting the adjustable piece or member. The arrangement is preferably such that all but the particular aperture that is coincident with the central orifice are rendered incapable of permitting the flow of gas through them.

60 The chief feature of novelty of the present construction is an improved means for keeping the adjustable piece or member in a gas tight position on the nozzle.

70 In order that this invention may be clearly understood and readily carried into effect we will proceed to describe the same more fully with reference to the accompanying drawings in which:—

Figure 1 is a vertical section, and Fig. 2 a sectional plan of a gas burner provided with our improved gas regulating device. Fig. 3 is an elevation taken at right angles to the position shown in Fig. 1. Figs. 4 and 5 are respectively a sectional elevation and a sectional plan of a modified construction of the gas regulating device. Figs. 6 and 7 are similar views to Figs. 4 and 5 showing a further modified form of our invention.

80 A is the burner tube, and B the gas nozzle which is screwed onto the gas supply pipe in the usual manner.

Referring first to the construction shown in Figs. 1, 2 and 3, the central gas orifice *c* is formed in an inverted metal cup C screwed as shown or otherwise secured in the body of the nozzle B in an eccentric position so as to form part of said nozzle, the position of the orifice *c* being central with regard to the burner tube A as above stated and consequently eccentric with regard to the axis of the cup itself. Closely fitting upon the inverted cup is a cup or hood D which is formed with apertures *d* of varying size concentrically arranged with regard to the axis of the cup or hood, any one of which apertures is adapted by the angular movement or rotation of the aforesaid hood to be brought into coincidence with the orifice in the inverted cup C, and the quantity of gas supplied to the burner thereby regulated. The size of the orifice *c* is about equal to that of the largest of the apertures *d*. To enable the hood to be readily manipulated by the fingers it may be provided with a finger piece *d'* adapted to be actuated from the exterior of the

burner tube. This finger piece may be arranged to travel over a dial or scale d^2 suitably engraved to indicate which aperture is in coincidence with the central orifice for any particular position of the hood.

The means that we prefer to employ for holding the cup or hood D upon the cup C comprise a stem or bolt d^3 having a countersunk head d^4 . This stem or bolt projects into the interior of the cup C and a steel spring d^5 is slipped over its projecting end and held in place by a nut d^6 . The hood D is thus held firmly upon the cup C but is free to be rotated.

The central orifice, although preferably circular, need not necessarily be so, and in some cases it may be advantageous to make it of elongated or segmental shape, as shown at C* in Figs. 4 and 5, the length of said orifice being such that it will not be entirely closed by the movement of the hood D in changing from one aperture d^* to another with regard to said segmental orifice, thus insuring that the gas supply from the nozzle to the burner shall not at any time be completely cut off by the movement of the aforesaid hood or sliding plate. In this construction the hood D is shown provided with a beading or flange d^o arranged so as to be actuated from the exterior of the burner tube. The projecting beading or flange may conveniently be milled or roughened so as to permit of its ready manipulation and a series of notches, figures or other indications may also be provided thereon to serve as an indication of the adjustment of the said hood.

According to a modified construction, the hood which has been hitherto described as provided with several apertures of varying size, may be provided with one centrally situated aperture C** varying in size at different parts thereof, the orifice in the nozzle also having an aperture d^{**} similarly formed so that by adjusting the hood or sliding plate, the central or approximately central space through which the gas can flow will be varied from that which occurs when the widest portions of the apertures coincide to that which occurs when their narrowest portions coincide. This construction as applied to a rotating hood D is shown in Figs. 6 and 7.

Although the above described improvements are especially suitable for incandescent gas lighting, we wish it to be understood that they may also be employed for heating purposes.

What we claim and desire to secure by Letters Patent of the United States is:—

1. A gas regulating device for burners comprising a burner tube, a gas nozzle in the form of an inverted cup located eccentrically with respect to the burner tube and having a single orifice approximately central

with respect to the burner tube, a rotary hood fitting upon the exterior of said inverted cup and perforated so as to be capable, when rotated, of varying the extent to which the aforesaid orifice is covered while preserving practically the same shape to the opening, and spring controlled means located within the cup for exerting an axial pull upon the hood toward the cup.

2. A gas regulating device for burners, comprising a burner tube, a gas nozzle in the form of an inverted cup located eccentrically with respect to the burner tube, and having a single orifice approximately central with respect to the burner tube, a rotary hood fitting upon the exterior of said inverted cup, and perforated so as to be capable, when rotated, of varying the extent to which the aforesaid orifice is covered while preserving practically the same shape to the openings, a stem extending from the hood into the interior of the cup, and a spiral spring exerting an axial inward pull upon the stem.

3. A gas regulating device for burners comprising a burner tube, a gas nozzle in the form of an inverted cup located eccentrically with respect to the burner tube and having a single orifice approximately central with respect to the burner tube, a rotary hood fitting upon the exterior of said inverted cup and perforated so as to be capable when rotated of varying the extent to which the aforesaid orifice is covered while preserving practically the same shape to the opening, a stem extending from the hood into the interior of the cup, a projection on the inner end of said stem, and a spiral spring situated around said stem and abutting against the said projection and the inner end of the cup.

4. A gas regulating device for burners comprising a burner tube, a gas nozzle in the form of an inverted cup located eccentrically with respect to the burner tube and having a single orifice approximately central with respect to the burner tube, a rotary hood fitting upon the exterior of said inverted cup and perforated so as to be capable, when rotated, of varying the extent to which the aforesaid orifice is covered while preserving practically the same shape to the opening, a screw threaded stem extending from the hood into the interior of the cup, a nut on the screw threaded end of the said stem, and a spiral spring situated around said stem and abutting against the said nut and the inner end of the cup.

5. A gas regulating device for burners comprising a burner tube, a gas nozzle in the form of an inverted cup located eccentrically with respect to the burner tube and having an orifice approximately central with respect to the burner tube, a rotary hood fitting upon the exterior of said inverted cup and formed with a plurality of apertures of different size arranged so that by rotating

the hood upon the cup any desired aperture may be brought into coincidence with the orifice in the said cup, and spring-controlled means located within the cup for exerting an axial pull upon the hood toward the cup.

5 6. A gas regulating device for burners comprising a burner tube, a gas nozzle in the form of an inverted cup located eccentrically with respect to the burner tube and having
10 an orifice approximately central with respect to the burner tube, a rotary hood fitting upon the exterior of said inverted cup and formed with a plurality of apertures of different size arranged so that by rotating
15 the hood upon the cup any desired aperture may be brought into coincidence with the orifice in the said cup, a stem extending from the hood into the interior of the cup, and a spiral spring exerting an axial inward pull
20 upon the stem.

7. A gas regulating device for burners comprising a burner tube, a gas nozzle in the form of an inverted cup located eccentrically with respect to the burner tube and having
25 an orifice approximately central with respect to the burner tube, a rotary hood fitting upon the exterior of said inverted cup and formed with a plurality of apertures of different size arranged so that by rotating
30 the hood upon the cup any desired aperture may be brought into coincidence with the

orifice in the said cup, a stem extending from the hood into the interior of the cup, a projection on the inner end of said stem, and a spiral spring situated around said stem and
35 abutting against the said projection and the inner end of the cup.

8. A gas regulating device for burners comprising a burner tube, a gas nozzle in the form of an inverted cup located eccentrically
40 with respect to the burner tube and having an orifice approximately central with respect to the burner tube, a rotary hood fitting upon the exterior of said inverted cup and formed with a plurality of apertures of different
45 size arranged so that by rotating the hood upon the cup any desired aperture may be brought into coincidence with the orifice in the said cup, a screw-threaded stem extending from the hood into the interior of
50 the cup, a nut on the screw-threaded end of the said stem, and a spiral spring situated around said stem and abutting against the said nut and the inner end of the cup.

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

CLARK WAY HARRISON.
ARTHUR CUMMING NOAD.

Witnesses:

T. SELBY WARDLE,
WM. MELLERSH JACKSON.