

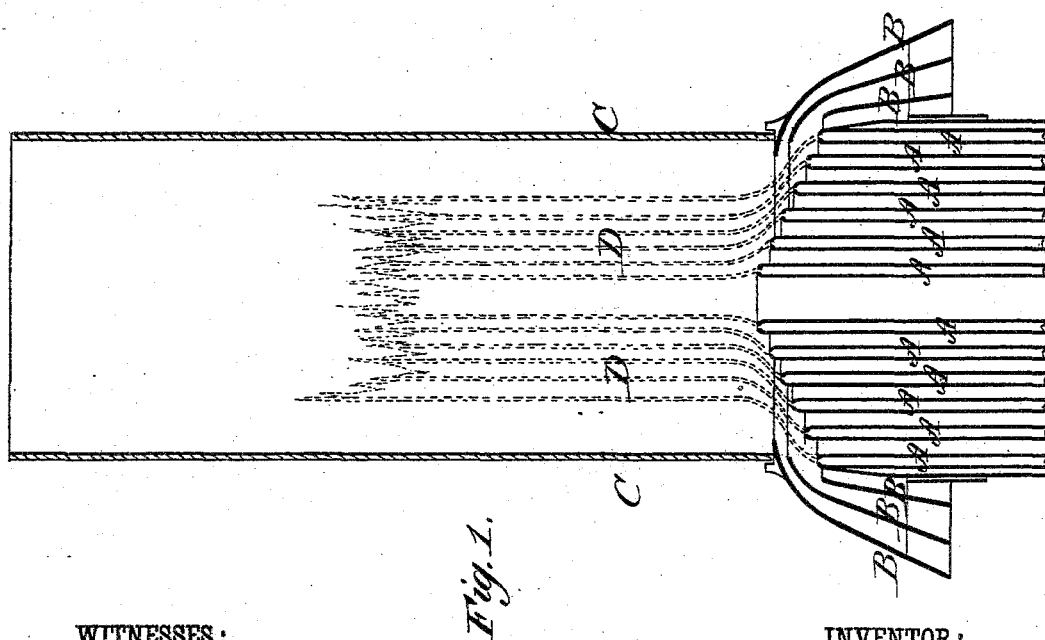
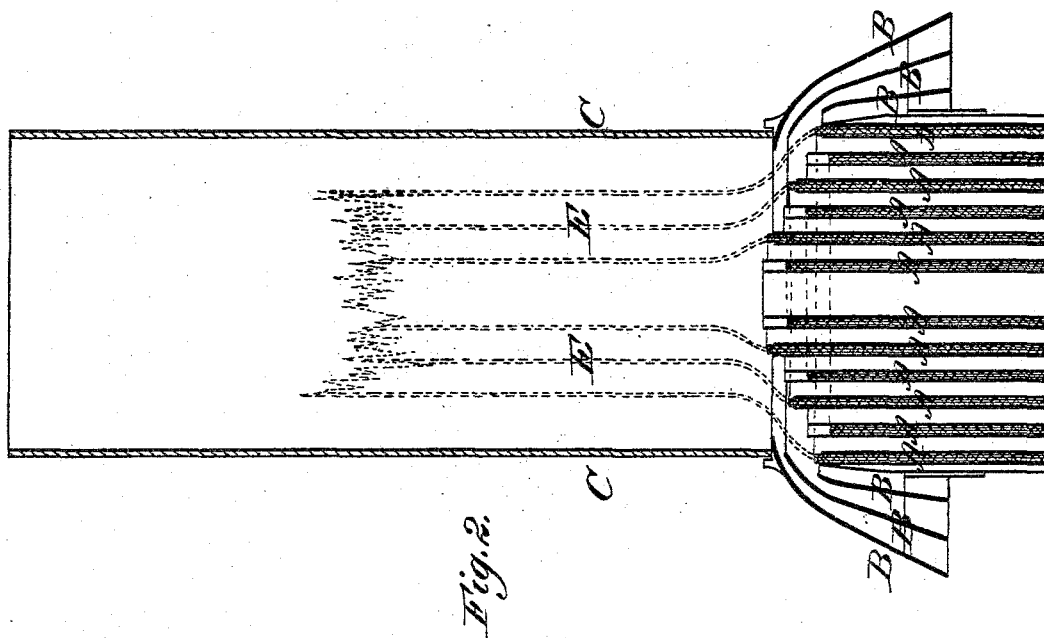
(No Model.)

2 Sheets—Sheet 1.

J. N. DOUGLASS.  
BURNER FOR GAS OR OIL.

No. 290,545.

Patented Dec. 18, 1883.



WITNESSES:

*Donn Twitcheell.*  
*C. Sedgwick*

INVENTOR:

*J. N. Douglass*  
BY *Munn Ho*  
ATTORNEYS.

(No Model.)

2 Sheets—Sheet 2.

J. N. DOUGLASS.  
BURNER FOR GAS OR OIL.

No. 290,545.

Patented Dec. 18, 1883.

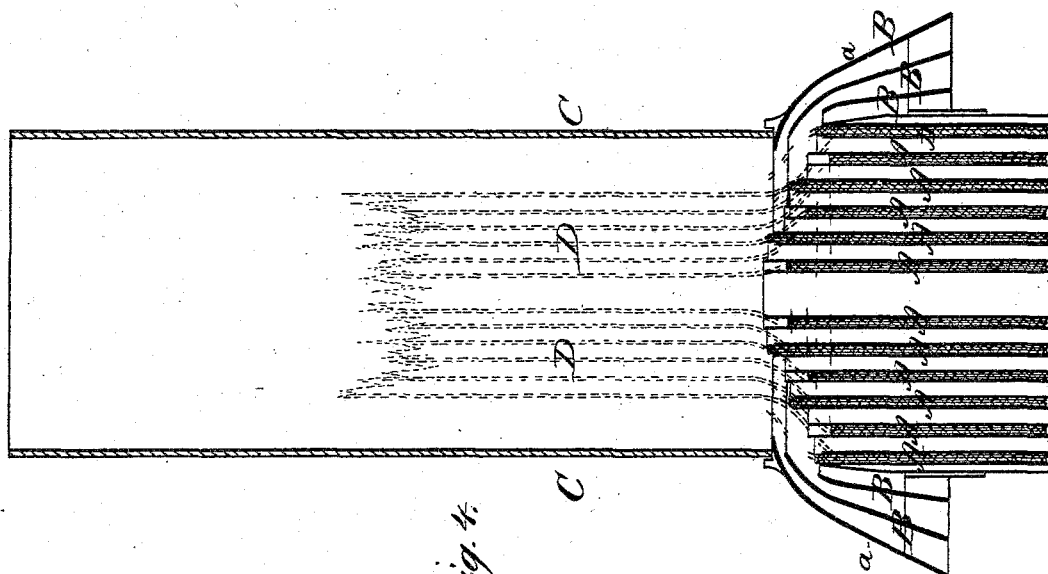


Fig. 4.

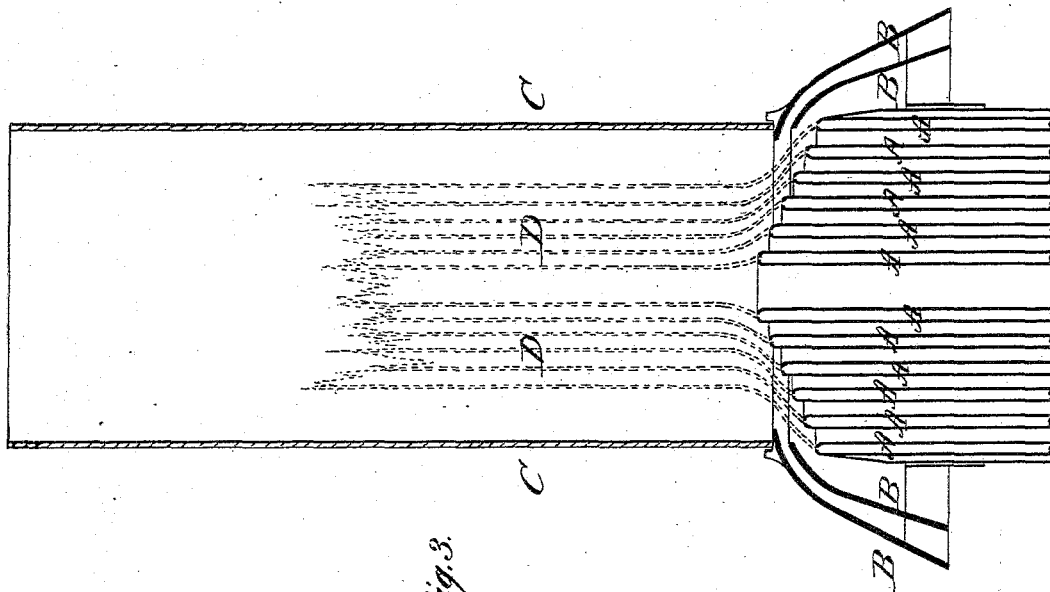


Fig. 3.

WITNESSES:

*Donn Twitchell*  
*C. Sedgwick*

INVENTOR:

*J. N. Douglass*  
BY *Min Ho*

ATTORNEYS.

# UNITED STATES PATENT OFFICE.

JAMES N. DOUGLASS, OF DULWICH, COUNTY OF SURREY, ENGLAND.

## BURNER FOR GAS OR OIL.

SPECIFICATION forming part of Letters Patent No. 290,545, dated December 18, 1883.

Application filed January 5, 1882. (No model.) Patented in England January 7, 1881, No. 84; in France February 2, 1881, No. 140,927; in Belgium March 11, 1881, No. 54,080; in Italy March 17, 1881, No. 2,533; in Canada April 20, 1881, No. 12,657; in Victoria April 20, 1881, No. 2,998; in Cape of Good Hope April 25, 1881, No. 386; in South Australia April 25, 1881; in New Zealand May 6, 1881, No. 641; in New South Wales June 14, 1881; in Austria June 21, 1881, No. 8,359; in Queensland June 30, 1881; in Germany July 20, 1881, No. 16,322; in Portugal October 7, 1881, No. 695; in Spain November 4, 1881, No. 41,043; in Western Australia December 22, 1881; in India February 18, 1882; in Hong Kong June 5, 1882; in Sweden August 29, 1882, and in Denmark October 19, 1882.

### *To all whom it may concern:*

Be it known that I, JAMES N. DOUGLASS, of Dulwich, in the county of Surrey, England, have invented certain new and useful Improvements in Burners, of which the following is a full, clear, and exact description.

The invention has for its object improvements in oil and gas burners having two or more rings or ring-chambers when oil is used and two or more perforated rings when gas is used, the ring-chambers being connected with deflectors constructed and employed as herein-after described, and the combination producing in each case a burner of a greatly-improved character as compared with those hitherto used.

The invention consists in the arrangement of an outer deflector surrounding the burner and lower part of the flames, one or more of which it covers, and in connection with this deflector is a deflecting gas-chimney, both deflector and chimney being so formed as to force the outer flame or flames onto the inner flame or flames, and thus to condense the flames to the requisite extent, and to deflect onto the internal and external surfaces of each of the flames the whole or nearly the whole of the ascending currents of air, and in such a manner as to invigorate the combustion of the flames and augment the intensity of their light, these deflectors being used with concentric flame rings or chambers arranged to form a conical burner.

The invention also includes the means of employing one or more of the rings of flame with perfect combustion, and thus decreasing or increasing the intensity of the light without any alteration in the external form or dimensions, which is a matter of great importance when the light is employed in combination with optical apparatus.

In the accompanying drawings, Figure 1 is a sectional view of my improved burner for six rings of flame. Fig. 2 is a sectional view, showing the same arrangement applied to an

oil-burner, and where three rings only are employed. Fig. 3 shows my improved burner with two deflecting-rings; and Fig. 4 shows burner with three, the downwardly-projecting and flaring enlargement of the chimney serving as one of the deflecting-rings.

A are concentric rings of oil and gas chambers.

B is the deflector, which may be formed, as in Fig. 3, with two rings, or with three or more rings or partitions, as in Figs. 1, 2, and 4.

C is the deflecting glass chimney, of less diameter than the outermost of the concentric rings of burners.

D, Fig. 1, shows flames at full intensity, and E, Fig. 2, flames at decreased intensity, with the three alternate rings only employed.

To decrease the intensity of the light of the oil-burner shown in Fig. 2, without altering its external form or dimensions, one or more of the inner rings of flame are extinguished by lowering their wicks within the wick-chambers by the usual racks and pinions provided for this purpose, and to increase the intensity of the light thus reduced the wicks are raised to their required level, and are united by the adjacent inwardly-deflected outer flame or flames.

To decrease the intensity of the light of a gas-burner without altering its external form or dimensions, one or more of the inner rings of flame are extinguished by shutting off the supply of gas by the usual cocks or valves provided for the purpose, and to increase the intensity of the light thus reduced these cocks or valves are opened and the ascending gas is ignited, as before described for the wicks of the oil-burner, by the adjacent inwardly-deflected outer flame or flames. The concentric hollow rings A are those, as ordinarily constructed, between which the air and oxygen pass to the interior and exterior of the inner flame or flames and to the exterior of the outer flame, as shown. The outer ring is lowest with respect to the others, and each ring ter-

minates slightly above the next outer, so that the inner ring is the highest, and the combined rings form a burrier of conical form.

By this my invention highly condensed and compressed flames are produced, differing in this respect from any burner hitherto used. The requisite condensation or compression is effected by having the deflector B constructed so as to sufficiently overlap one or more of the outer rings and flames of the burner. This deflector causes the maximum quantity of air and oxygen to be conducted up to the outer flames and forced onto them at the proper points of combustion, thereby condensing them, as shown, and thus producing perfect combustion. The deflector B is formed of one or more rings or partitions, the number being increased or decreased when a larger or smaller number of rings forming the burner A are employed, so that, by means of such deflectors acting in combination with the glass chimney C, air and oxygen are delivered to the flames at the proper points, so as to cause them to converge and to condense and to compress them, as shown, and thus produce perfect combustion.

In Fig. 4 a chimney having a downwardly-projecting and flaring enlargement, *a*, forming a deflector, is shown, in Figs. 1, 2, and 3, a straight deflecting cylindrical chimney, which rests on lugs, projections, or brackets formed or cast on the outer surface of the deflector B. A curved chimney could be used with the arrangement shown in Figs. 1, 2, and 3.

It is to be observed that a very important advantage as regards both efficiency and economy is obtained by the use of my improvements in burners, because the temperature of the glass chimney is considerably less than with present burners, and thus, besides diminishing breakage of the glass chimneys, flames of greater intensity than hitherto employed can be advantageously used.

I am aware that a conical burner formed of a series of concentric rings is not new, and I am also aware that a series of concentric deflectors surrounding an ordinary Argand burner is old, and I am further aware that air has been deflected to the flame in nearly a horizontal position and at different heights, and I therefore do not claim such, broadly; but

What I do claim, and desire to secure by Letters Patent, is—

1. The combination, with a conical burner, formed of a series of rings terminating one above the other, of a series of concentric and flaring deflecting-rings surrounding and overlapping one or more of the concentric rings of the burner, and a chimney of less diameter than the outermost of the concentric rings of burners, substantially as herein shown and described, whereby the whole series of flames are deflected toward the center of the burner, insuring perfect combustion and increasing the intensity of their light, as set forth.

2. The combination, with a conical burner formed of a series of concentric rings, A, terminating one above the other, of the series of concentric and flaring rings B and the chimney C, provided with the downwardly-projecting and flaring enlargement *a*, the said rings and enlargement forming a series of deflectors overlapping one at least of the outer concentric rings, A, substantially as and for the purpose set forth.

The above specification signed by me this 22d day of October, 1881.

JAS. N. DOUGLASS. [L. S.]

Witnesses:

AUG. SPICAUD,

ROBERT H. J. COMERFORD,

*Clerks to Messrs. Comerford & Co., Notaries Public, London.*