(No Model.) 2 Sheets—Sheet 1.

E. BEACH.

ARGAND GAS BURNER.

No. 383,338. Patented May 22, 1888.

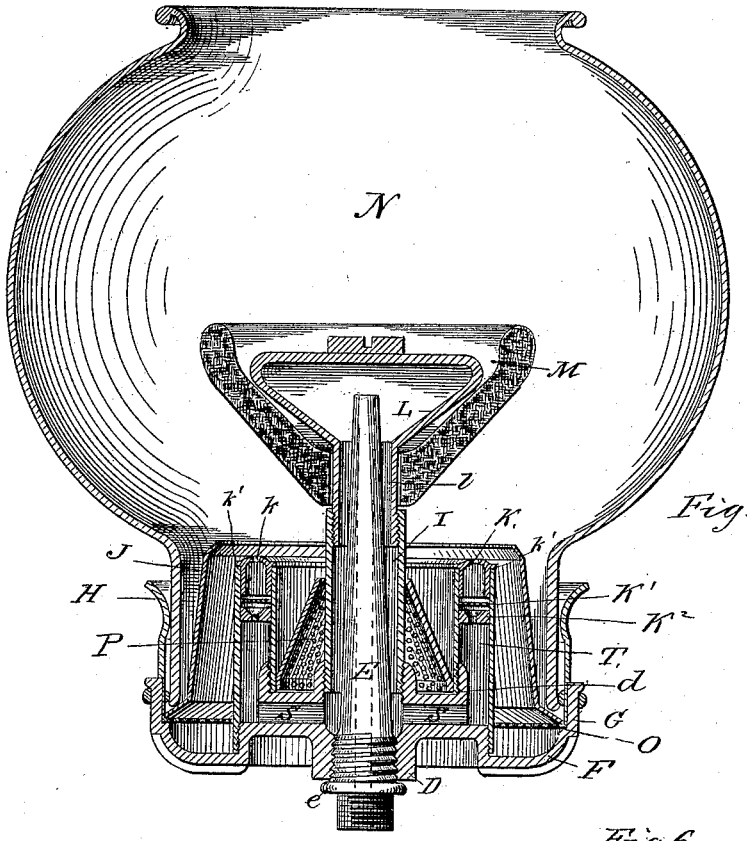
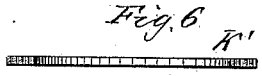


Fig. 1.

Fig. 2.



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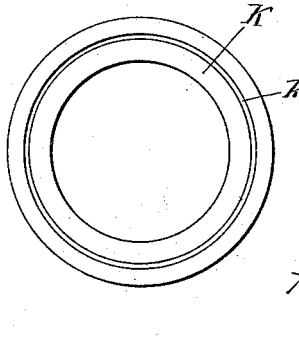
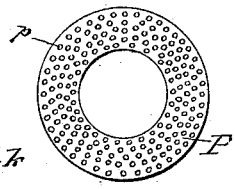


Fig. 4.



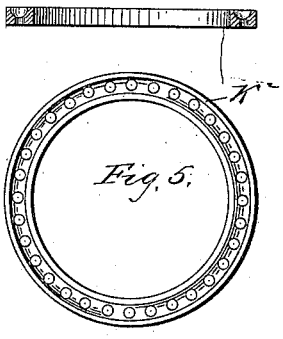
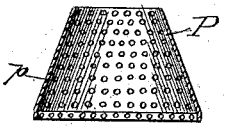


Fig. 5.

Fig. 3.



Witnesses:
J. R Stuart
L. Seward, Bacon.

Inventor:
Elias Beach.
By, Munn & Co
Atty.

(No Model.) 2 Sheets—Sheet 2.

E. BEACH.

ARGAND GAS BURNER.

No. 383,338. Patented May 22, 1888.

Fig. 2.

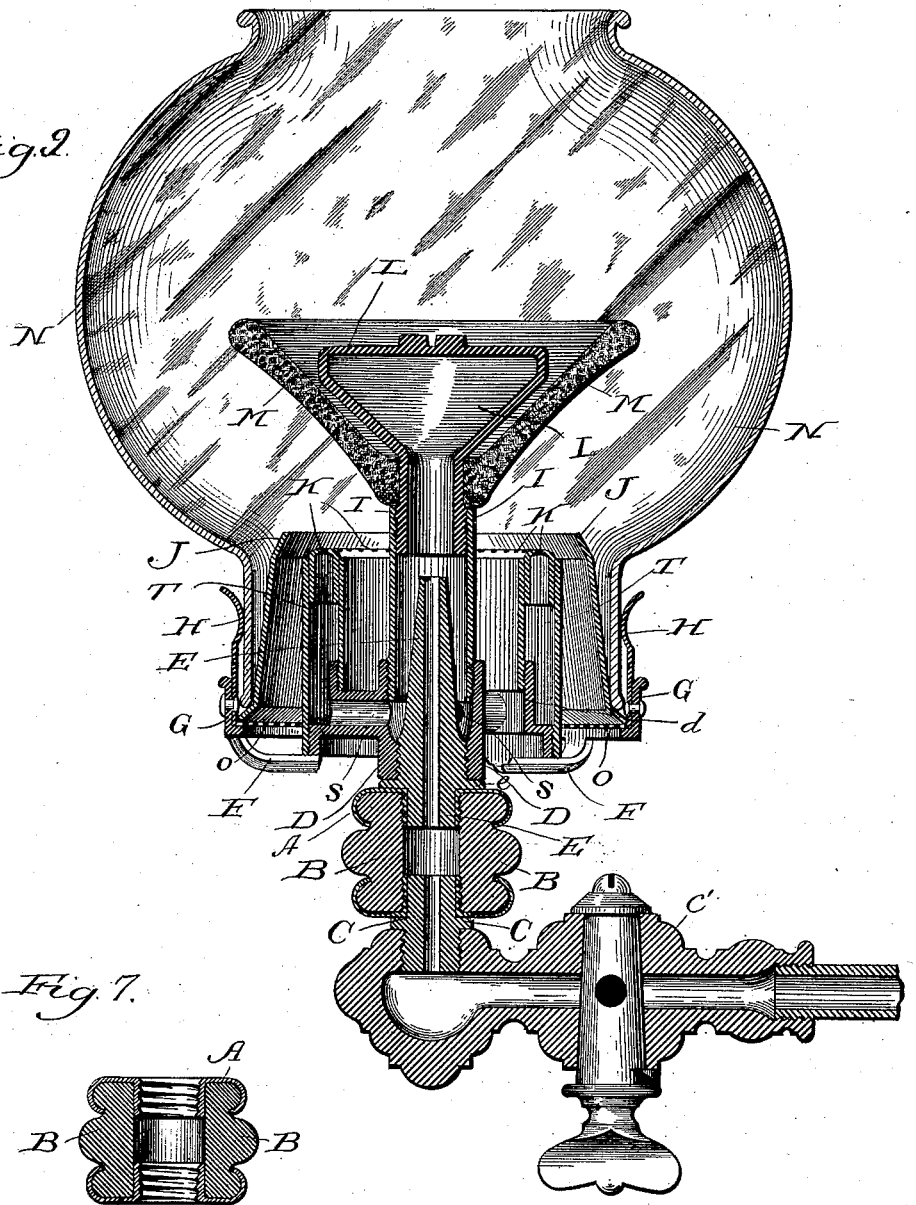


Fig. 7.

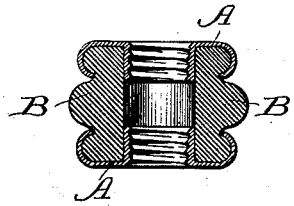


Fig. 8.

Witnesses:
Chas. E. Gaylord.
L. Sumrd. Bacon.

Inventor:
Elias Beach
By Munn & Co.
Attys.

UNITED STATES PATENT OFFICE.

ELIAS BEACH, OF CHICAGO, ILLINOIS.

ARGAND GAS-BURNER.

SPECIFICATION forming part of Letters Patent No. 383,338, dated May 22, 1888.

Application filed January 31, 1887. Renewed April 19, 1888. Serial No. 271,125. (No model.)

To all whom it may concern:

Be it known that I, ELIAS BEACH, a citizen of the United States, residing at Chicago, in the county of Cook and State of Illinois, have invented certain new and useful Improvements in Argand Gas-Burners; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

My invention relates to an improvement in Argand gas-burners; and it consists in the construction and arrangement of the parts, which will be more fully hereinafter described, and pointed out in the claims.

One object of my invention is to provide a gas-burner which will insure complete and perfect combustion of gas, and by suitable means cause the same to produce a steady and brilliant light.

A further object of my invention is to provide a gas-burner which is adapted to be attached to ordinary fixtures in such a manner as to prevent the heating of said fixtures by the ignited gas in the burner.

I attain these objects by the burner illustrated in the accompanying drawings, wherein like letters of reference indicate similar parts in the several views, and in which—

Figure 1 is a vertical central section of my improved burner. Fig. 2 is a detail top plan view of the conical perforated thimble. Fig. 3 is a transverse vertical section of the same. Fig. 4 shows a detail top plan view of the two-part nipple or burner-tip and the continuous annular slot. Fig. 5 is a detail top plan view of the gas-chamber adjusting-ring. Fig. 6 is a detail view in vertical cross-section of the gas-chamber adjusting-ring and the interposed perforated ring-plate. Fig. 7 is a detail view in cross-section of the heat-non-conducting union. Fig. 8 is a detail view in section of the metallic binding for the said union. Fig. 9 is a transverse vertical section of a modified form of my improved burner.

C′ represents a portion of a fixture of the ordinary form of construction, as shown in Fig. 9. To this fixture C′ a connecting-joint, C, is secured, which is provided with a central opening therethrough, an upper and lower screw-threaded portion, and a central rib on its outer side dividing said screw-threaded portions. A union, B, constructed of wood or other heat-non-conducting material, is connected to the joint C between the burner proper and the fixtures, and is provided with metallic end caps or bindings, A. The union B is preferably made in the shape shown in Fig. 7, but may be constructed in any other suitable form. As shown, it consists of a ring of wood having depressions in its outer surface near its ends, which are covered by metallic caps A, constructed to conform to the curvature of said ends, their outer edges resting in said depressions and their inner edges struck up to form a lining for the ends of the bore of said union B. The latter-named parts of the caps A are screw-threaded, so as to provide for the attaching of said union to the fixtures and burner. In Fig. 8 one of these caps A is shown in detail, the general construction of the same being fully illustrated thereby. The union B connects the joint C with a conical-shaped tube, E, said tube being screw-threaded on its lower end to engage with the said union.

D is a bracket or support of circular shape, with an opening in its center, through which the conical tube E passes. The lower inner face of said bracket is provided with a female screw, which engages with the upper screw-threaded portion of the tube E, thereby bringing said bracket in contact with the flange *e*, which forms a rest for the same and rigidly holds it in place. A series of hollow radial arms, S, extend out from said bracket and support an annular rim, *d*, which is provided with screw-threaded portions on its upper, inner, and lower outer sides, to which is secured a cylindrical chamber, T, which extends entirely around said portion *d*, and is provided with a closely-fitting nipple or burner-tip, K, which is inserted in its upper end and projects somewhat above it, where it is provided with a continuous slot, *k*, the said nipple or tip being constructed in two parts and supported on the inner and outer walls of the said chamber T by flanges *k′*, projecting outwardly therefrom, which rest on the top of the walls of the said chamber.

Immediately under the nipple or tip K a perforated thin metallic plate, K′, is interposed between and held in position by the walls of the chamber T. Under the plate K′ a heavier plate, K², is provided, which is also

constructed with apertures and held by the walls of the chamber T in a manner similar to the plate K′. These two plates K′ and K² may be securely fastened in the said chamber T in their desired position by any well-known mechanical means. The plate K² is adapted to keep the walls of the chamber T at an unvarying and equal distance apart, thereby holding them in perfect relative adjustment to each other, and the plate K′ is for the purpose of equally distributing the pressure of the gas to the flame of the tip or nipple K.

Surrounding part of the conical tube E is a cylinder, I, which is secured at its lower end to the central portion of the bracket D. This cylinder or tube I extends upward above the burner-tip K, and has a flaring hollow chamber, L, secured thereto by screw-threads on its outer lower end, which engage with like threads on the inner surface of the cylinder I, thus leaving the top of the said cylinder to form a shoulder or bearing-surface. The hollow chamber L has a downwardly-extending tubular neck, *l*, and upper flaring portion, extending out to a point directly over the burner K, and a top flat portion provided with a lug having a nick or cut therein for the reception of a screw-driver, whereby the said part may be secured in the cylinder I. The tube E extends upward into the chamber L, the sides of which pass up on a gradual incline, and ending about the central portion of the said chamber L. The chamber L is surrounded by a non-fusible deflector, M, which may or may not be constructed to conform to the shape of the said chamber, but preferably of the form of an inverted frustum of a cone, and is constructed of kaolin, asbestus, or any other suitable single material or combined materials, being securely held in place upon the upper end of the cylinder I by having its lower end resting on said upper portion of the said cylinder. The tubular neck *l* of the said cylinder I passes through an opening in the lower end of the deflector, which is constructed of such diameter as to closely fit said tubular portion or neck, so that when the said chamber is secured to the cylinder I it is forced down until the deflector is firmly held in connection with the cylinder I, the base of the flaring portion of the chamber L resting on the inner portion of the deflector M at the top of the lower opening thereof. As will be seen, the deflector M is extended out a greater distance than the chamber T, thereby presenting a larger surface for the flame to impinge against. A small space is left between the outer surface of the flared sides of the chamber L and the inner surface of the deflector M, to prevent the burning out of the walls of the said chamber during the highly-incandescent state of the said deflector M.

F represents a series of supports or arms attached to the bracket D in any suitable manner, and supporting on their outer ends a gallery, G, on which is secured the globe-holder H. An air deflector or thimble, J, of well-known form of construction, is also placed on said supporting-arms F, being retained in position thereon by an outwardly-extending flange constructed on its lower edge, which flange is placed in the angular portion of the gallery G, upon which the globe N rests. The space between the lower edge of the deflector J and the chamber T is provided with a perforated plate, O, through which the air passes as it is drawn into the burner, and by virtue of said perforations the current of air is divided and passes into the burner more steadily and with less pressure than is usually the case in burners of this class.

Between the outer surface of the cylinder I and the inner surface of the inner wall of the chamber T a perforated thimble, P, is mounted, and rests at its base upon the top of the series of hollow radial arms S, extending at its top close around the cylinder I, and extending outward at the bottom thereof to the inner wall of the chamber T. This thimble P is provided with a series of apertures, *p*, which, in consequence of the conical form of the said thimble P, are arranged in spiral order, and act to finely divide the current of air passing therethrough, and adapting it to be more readily distributed against the flame produced by the burning gas which exudes from the apertured nipple or tip K, mounted on the top portion of the chamber T.

In Fig. 9 the same construction of burner is illustrated, as heretofore described, with certain modifications of construction of some of its parts. In this instance the tube E extends only partially up through the cylinder I and allows the gas to escape therethrough below the lower portion of the neck *l* of the chamber L; but I make no claim herein to this arrangement of said tube and cylinder, as the same forms a portion of the invention constituting the subject-matter of an application for Letters Patent filed by me January 10, 1887, Serial No. 223,886. The nipple or tip K in this form of burner is constructed of a single bent piece of metal provided with a series of perforations, no perforated plates K′ and K² being used, the gas passing directly into the nipple or tip K. In this construction the thimble P is dispensed with, and the current of heated air is allowed to pass in an unbroken current to the flame and not separated, as hereinbefore described, by the perforated thimble P. When the gas is turned on by the key in the fixtures, it passes through the joint C into the conical tube E, and from thence up into the chamber L, and when it reaches the top thereof it is deflected outward and downward onto the inclined sides thereof and passes into the cylinder I, and from thence out through the radial arms S into the chamber T, where it ascends and escapes through the burner K, at which point it is ignited. When the gas is ignited, the flame produced is inclined slightly inward by reason of the current of air coming up through the thimble J and impinges against the deflector M, which,

being of non-fusible material, soon becomes heated and very brilliant, and in turn adds to the brilliancy of the ignited gas. The draft produced by the combustion of the gas draws the air, which will have become heated, in finely-divided currents, up through the perforated thimble P to the inside of the flame, and thereby increases the combustion. By this heating of the deflector M the walls of the hollow chamber L, which, as above stated, is placed in close proximity and entirely surrounded by the said deflector, are heated to a high degree, thereby heating the gas, which in turn transmits heat to the cylinder I, arms S, and chamber T, which in turn heat the gas and air passing therethrough. By this heating of the gas a more perfect combustion is obtained, and by the heating of the said parts the air which passes into the burner is also heated, and in this condition is more quickly and readily mingled with the gas, thereby causing a more perfect and rapid combustion of the oxygen of the air and the gas. It will thus be seen that a great degree of heat is confined to the different parts of the burner, which in other burners is conducted to the fixtures, which is objectionable, and which objection I practically overcome by means of the union B, constructed of heat-non-conducting material, thereby retaining the heat in the burner, which would otherwise be absorbed by the fixtures, and thus aiding in a more perfect working of the burner.

It is obvious that many minor changes in the construction and arrangement of the parts could be made and substituted for those shown and described without in the least departing from the nature and principle of my invention.

Having thus described my invention, what I claim as new, and desire to secure by Letters Patent, is—

1. In an Argand gas-burner, the combination of the bracket provided with radial hollow arms, the conical tube screwed centrally upon said bracket, the cylinder surrounding said tube, and also secured to the bracket, the burner surrounding the cylinder and secured to the bracket, the deflector secured to the bracket and surrounding the burner, the flaring chamber, and flaring deflector surrounding said chamber, said deflector and chamber being supported on the upper end of the cylinder, substantially as set forth.

2. The combination, with the bracket having radial hollow arms, the central tube, the cylinder surrounding said tube, and the burner surrounding the cylinder, all being secured to the bracket, of the conical perforated thimble interposed between the cylinder and the burner, substantially as and for the purpose specified.

3. In an Argand gas-burner, the combination of the conical tube, the cylinder surrounding said tube, the hollow chamber mounted thereon, the non-fusible conical-shaped deflector surrounding said hollow chamber, the bracket having hollow arms connecting and supporting the burner-chamber, the perforated thimble mounted between the burner-chamber and the cylinder surrounding the central tube, and the outer thimble or air-conductor and deflector, substantially as described.

4. In an Argand gas-burner, the combination of the union B, having caps or bindings A, a conical tube, E, connected thereto, a cylinder, I, surrounding said tube, a hollow flaring chamber, L, a non-fusible deflector, M, surrounding chamber L, a bracket, D, having hollow radial arms S, supporting and connecting the chamber T with the cylinder I, a suitably-apertured tip or burner, K, inserted in the chamber T, and a suitable globe-support, substantially as described.

In testimony whereof I affix my signature in presence of two witnesses.

ELIAS BEACH.

Witnesses:
WM. E. HINCHLIFF,
F. C. SCHOENTHALER.