

(No Model.)

C. B. HARRIS.
INCANDESCENT GAS BURNER.

No. 410,549.

Patented Sept. 3. 1889.

Fig. 1,

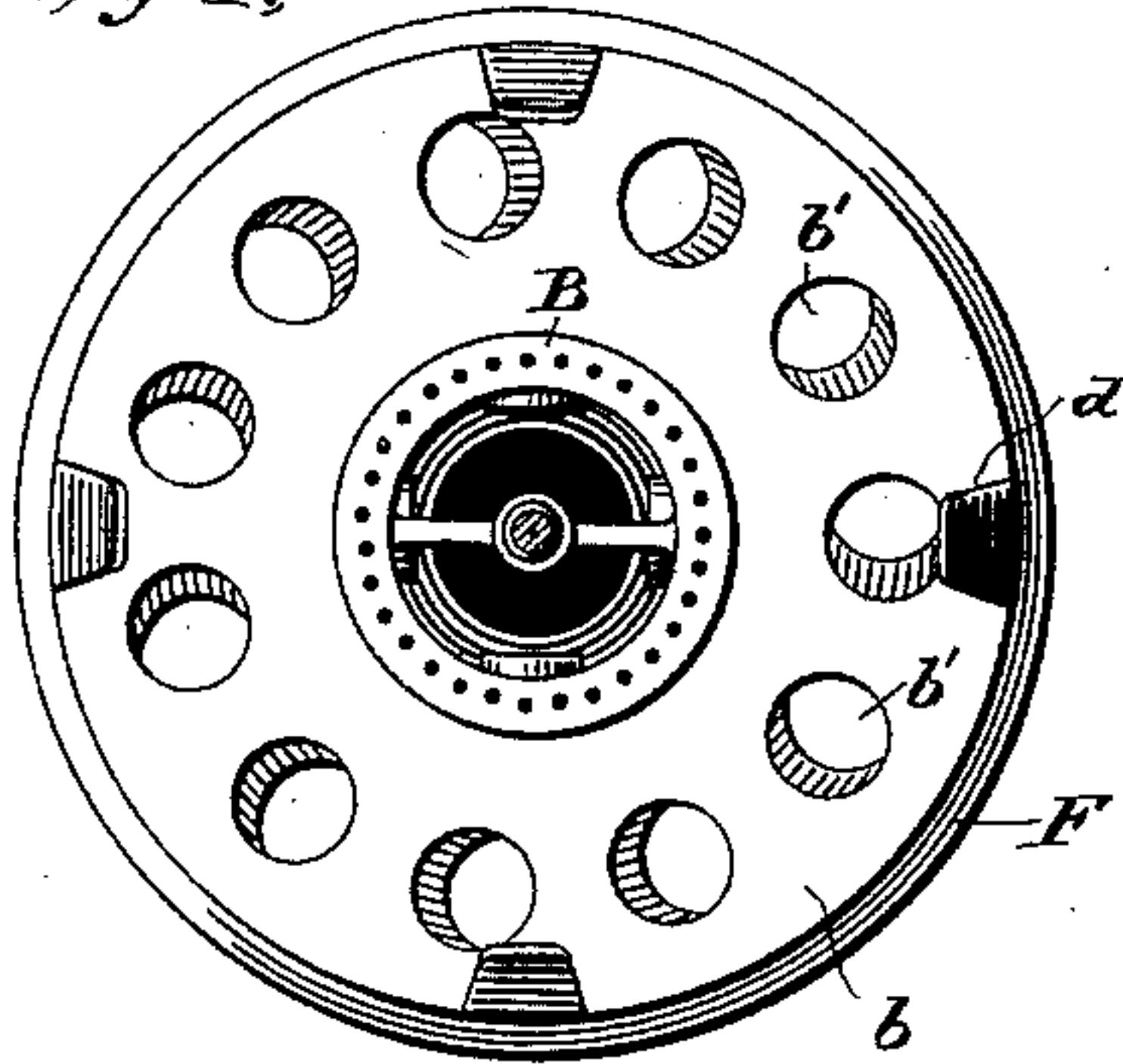


Fig. 3,

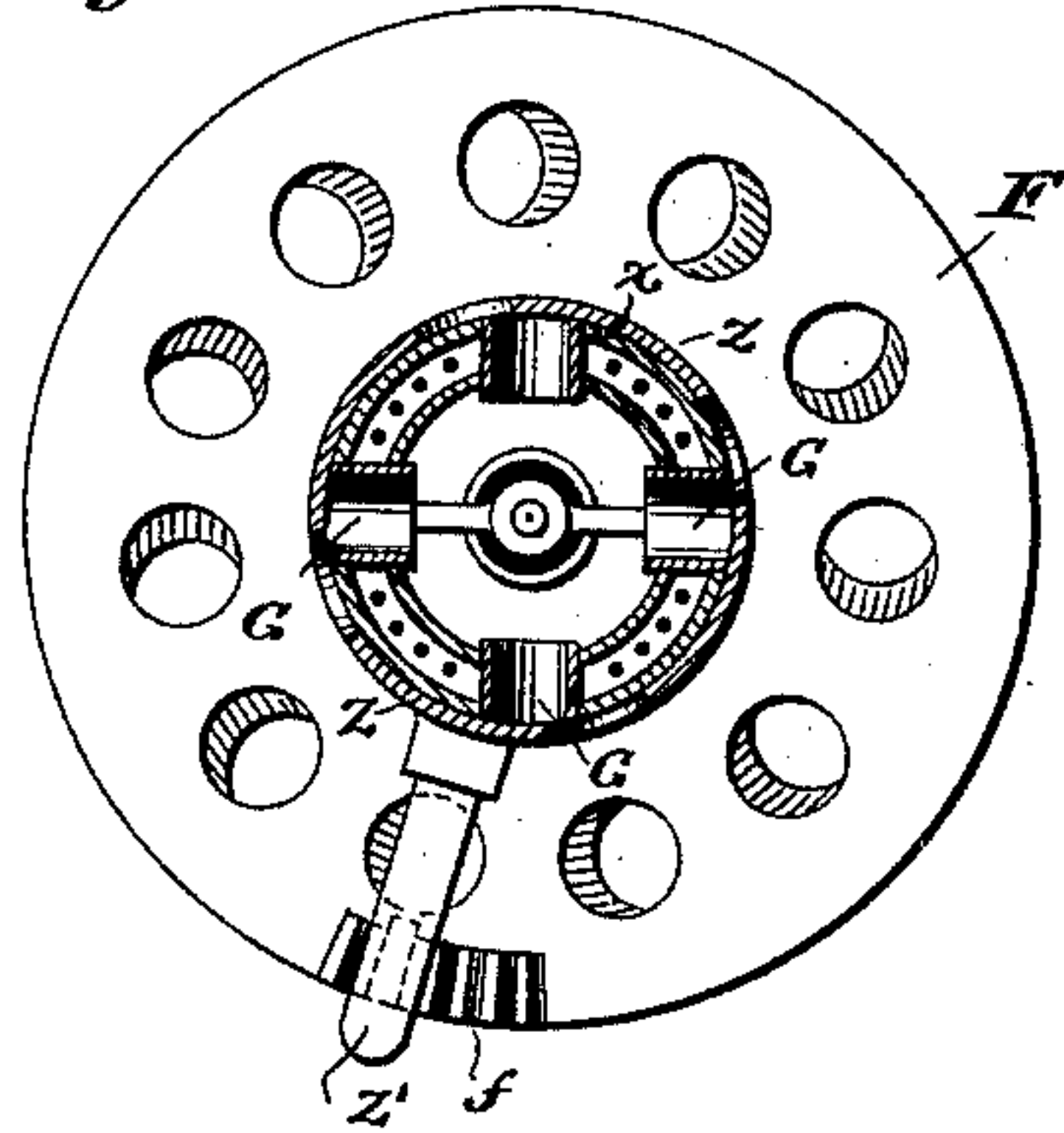


Fig. 4,

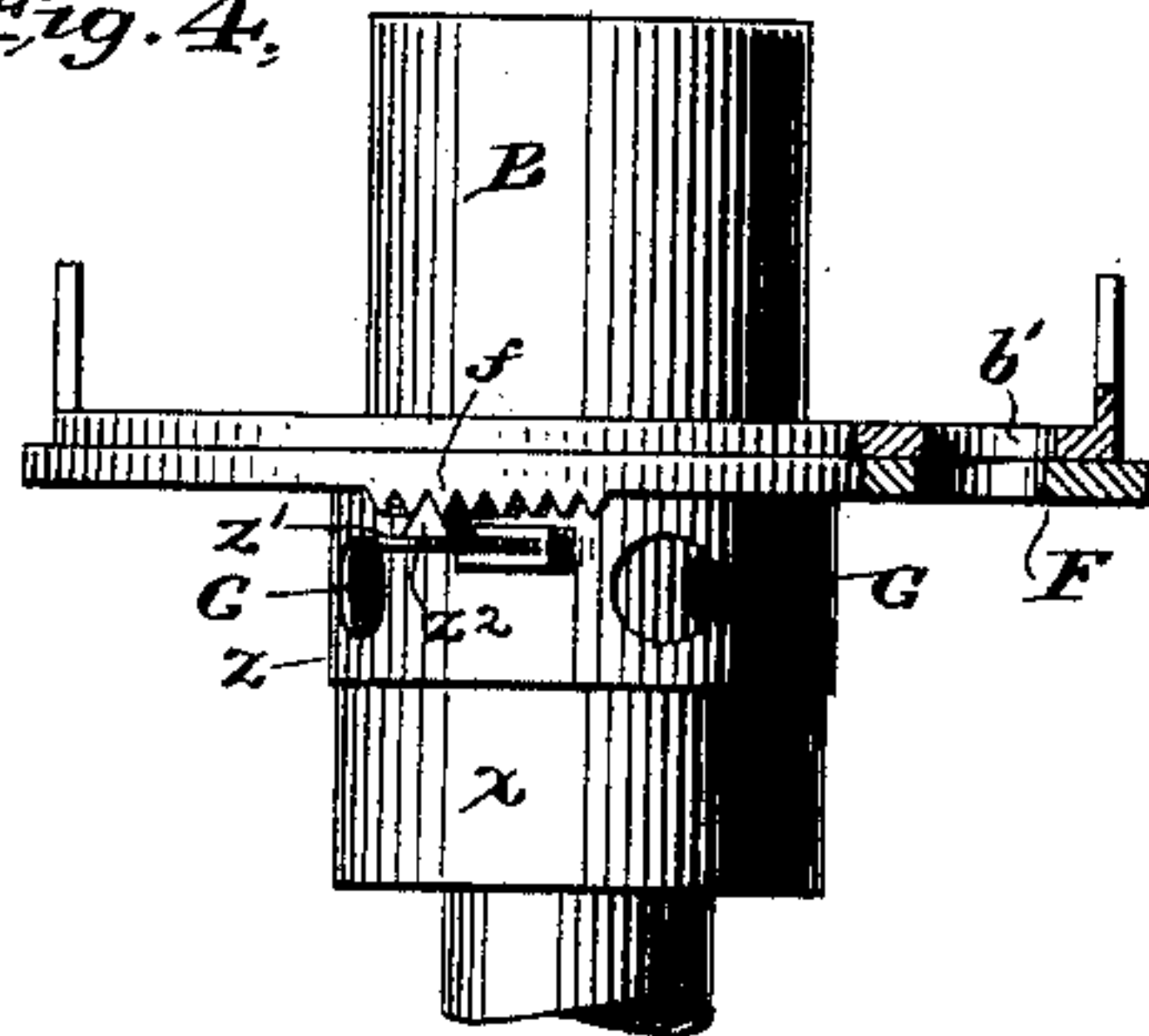


Fig. 5,

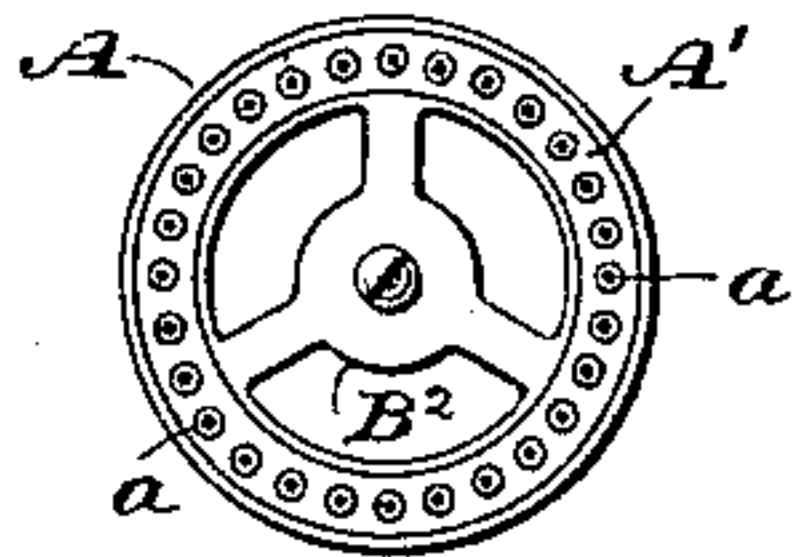


Fig. 2,

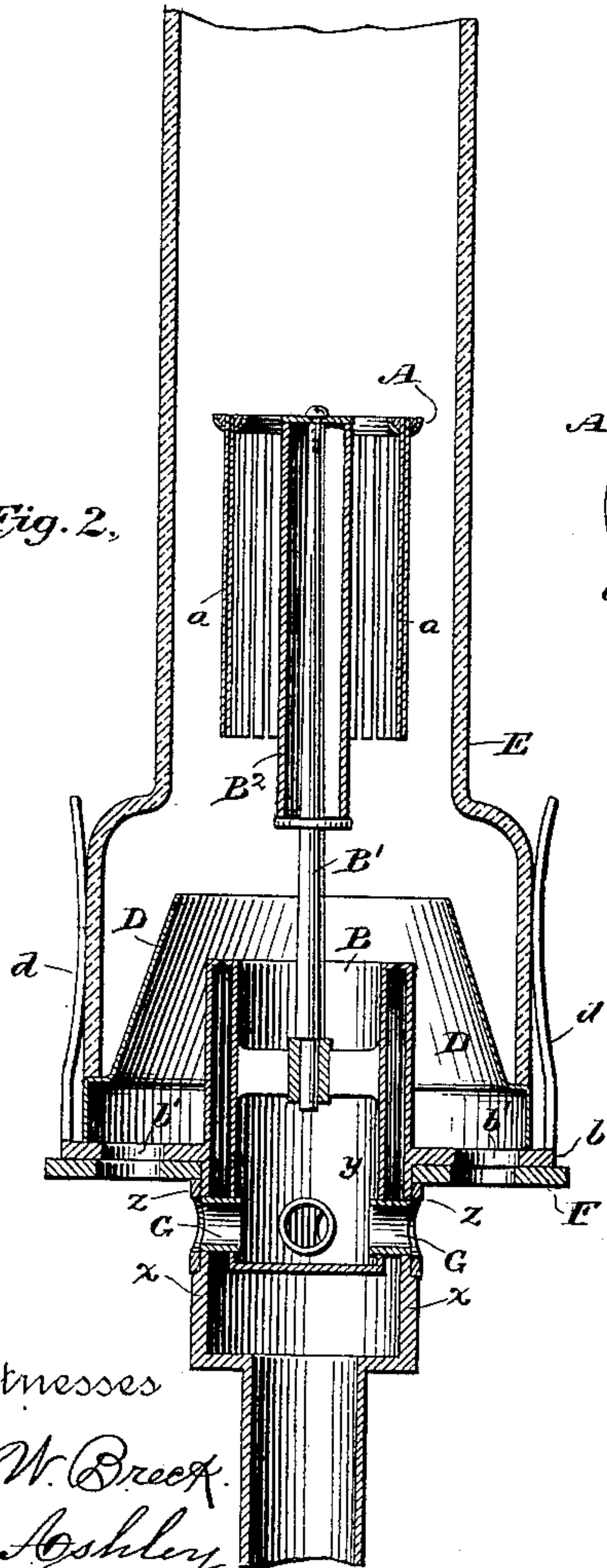
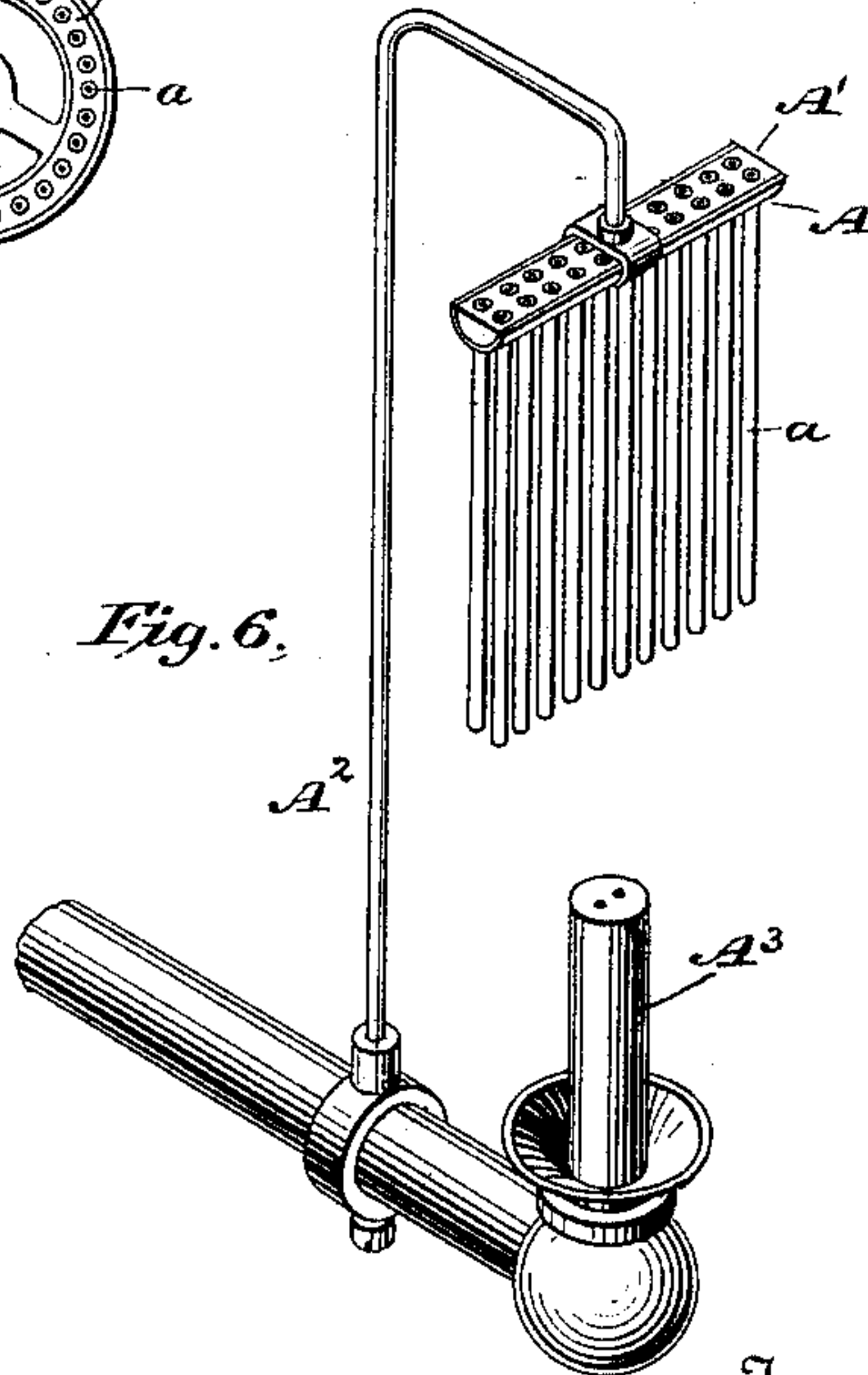


Fig. 6,



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INCANDESCENT GAS-BURNER.

SPECIFICATION forming part of Letters Patent No. 410,549, dated September 3, 1889.

Application filed April 29, 1889. Serial No. 309,045. (No model.)

To all whom it may concern:

Be it known that I, CHARLES B. HARRIS, a citizen of the United States, residing at New York, in the county and State of New York, have invented certain new and useful Improvements in Incandescent Gas-Burners, of which the following is a specification.

My invention relates to that class of burners in which an incandescing element, pencil, or filament is suspended in or above a hydrogen or water gas flame.

My invention relates, first, to the incandescing element, and, second, to the burner proper. In many lamps of this kind a vertical pendent pencil, formed of a mixture of some refractory earth—such, for instance, as magnesia, zirconia, &c.—mixed with some vehicle or binding material, has been employed, such pencils being formed by expressing the compound through a suitable die. With such an incandescing element it is important to reduce the amount of material in the pencil to a minimum, so that it will become readily and instantly incandescent in the heat of the flame, a group or number of such pencils being employed for each burner; but it is not practicable to make the pencils very slender, as after being burned they are delicate and frail. I purpose making the pencils tubular and with as thin walls as possible, so that a minimum of material will afford a maximum illuminating-surface and the mass of the material in each pencil be so small that it will at once become incandescent on exposure to the heat of the flame.

Further, in burners of this type I employ a reflecting-core, preferably of the same material as the pencils or filaments, arranged centrally within the circle of pendent pencils. When magnesia is used, it is perfectly white and reflects outwardly all the light and heat thrown toward the center of the burner. Further, I provide a certain improvement in circular burners, by which air may be supplied to the center and exterior of the flame, and both supplies be simultaneously adjusted, either to increase one and diminish the other, or to increase or decrease both by a single movement.

In the accompanying drawings, Figure 1 is a top view of my improved burner with the chimney, incandescent material, and cone-shaped deflector removed; Fig. 2, a vertical

central section of the complete burner; Fig. 3, a bottom plan view; Fig. 4, a side elevation with the chimney and cone-shaped deflector removed; Fig. 5, a detail plan view of the filaments or incandescing elements and their holder, and Fig. 6 a perspective view illustrating a group or head of tubular pencils arranged above an ordinary fish-tail burner.

The incandescing elements or pencils *a* are made tubular, the opening through the core preferably extending entirely through them from one end to the other. They may be made of a mixture of magnesia and starch or magnesia and glue, and made in the same manner that ordinary small macaroni is made—that is to say, a plastic mixture of magnesia and binding material is expressed through dies of suitable construction to produce elongated tubular filaments. These filaments are preferably allowed to dry and are then cut into the desired lengths. After being burned they are ready for use. When such pencils are suspended above a flame, they heat both from the exterior and the interior, and, as will be obvious, a maximum amount of illuminating-surface is attained with a very small quantity of material, and consequently they quickly become incandescent. The same amount of illuminating-surface may therefore be obtained with a less quantity of gas. They may be carried in a trough-shaped head *A*, the pencils projecting through apertures in the trough, and be held in place by a packing of cement *A'*, preferably of the same compound of which the pencils are made, applied while in a plastic condition. In Fig. 6 such a head mounted upon a suitable support *A*² is shown suspended above an ordinary fish-tail burner. In the other figures a different type of burner *B* is shown. It is of circular or Argand shape. From the interior of the cylindrical burner an upright or post *B'* extends, and upon this post may be mounted the central light and heat reflecting core *B*³, which in this instance is an elongated cylinder placed over the post and resting upon a flange thereon. The pencils *a* are suspended above the burner *B* and carried, in the same manner as shown in Fig. 6, in a circular head or trough, the trough being supported centrally upon the post *B'*.

The burner B is provided with the ordinary horizontal annular flange *b*, upon which is mounted the ordinary cone-shaped deflector D and spring-arms *d*, that hold the lamp-chimney E. The horizontal flange *b* is provided with a series of apertures *b'*, and a circular movable plate F, having corresponding apertures is arranged beneath the flange. By turning the plate the amount of air admitted to the exterior of the flame may be regulated. Below the plate F a series of short horizontal tubes *g* extend from the outer wall *x* of the burner to the interior of the inner cylinder *y*, and around the outer wall *x* is arranged a movable collar or band *z*, having apertures corresponding with the tubes *G*. By moving this band, therefore, the amount of air supplied to the interior of the burner may be regulated. The band *z* is provided with a projecting spring-arm *z'*, by which it may be turned, and this arm has upon its upper face a tooth *z''*, that engages in notches *f* in the under face of the movable ring F. When the ring or band is turned so that the tooth does not engage the notches *f*, either may be adjusted separately. By bringing the tooth into engagement with one of the notches the movement of the arms *z'* actuates both the band *z* and the ring F, and as the parts are adjusted the supply of air may be simultaneously increased at the center and decreased at the exterior, or vice versa, or both supplies may be increased or decreased together.

I am aware that it has been proposed to use a tubular carbon for electric lamps, which is raised to incandescence by an electric current, as shown in Patent No. 280,341, granted to Alexander Bernstein July 3, 1883, and I do not claim such subject-matter.

I claim as my invention—

1. An incandescing pencil consisting of magnesia, or similar refractory substance, in tubular form.

2. The combination, with a gas-burner, of a

group of tubular incandescing pencils, of the character described, arranged or hung vertically above the burner, so as to be raised to incandescence by the heat of the burner.

3. The combination, substantially as set forth, with a burner, of a series of incandescing pencils or filaments, and a centrally-arranged light-reflecting core, of the same or like material.

4. The combination, substantially as set forth, with a burner, of a group of incandescing pencils or filaments, and a reflector of like material arranged in the interior of said group in such manner as to reflect the light and heat outwardly.

5. The combination of a circular burner a circular series of incandescing elements or pencils arranged above the burner, a support for the elements or pencils extending up from the center of the burner, and an interior reflecting-core arranged within the circle of incandescent material upon said central support.

6. The combination of the circular burner having an interior air-supply inlet for supplying air to the interior of the annular flame, an exterior air-supply inlet for supplying air to the exterior of the flame, and simultaneously-adjustable air-supply regulators, as F and *z*, for regulating simultaneously both the interior and exterior supply of air.

7. The combination of a circular burner, its flange having air-inlets, the movable ring F, having corresponding apertures, the air-tubes *G*, leading to the interior of the burner, the band or collar *z*, having corresponding apertures, and interlocking devices, as *f* and *z''*, for locking the ring and band together for simultaneous adjustment.

In testimony whereof I have hereunto subscribed my name.

CHARLES B. HARRIS.

Witnesses:

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EDWARD C. DAVIDSON.