

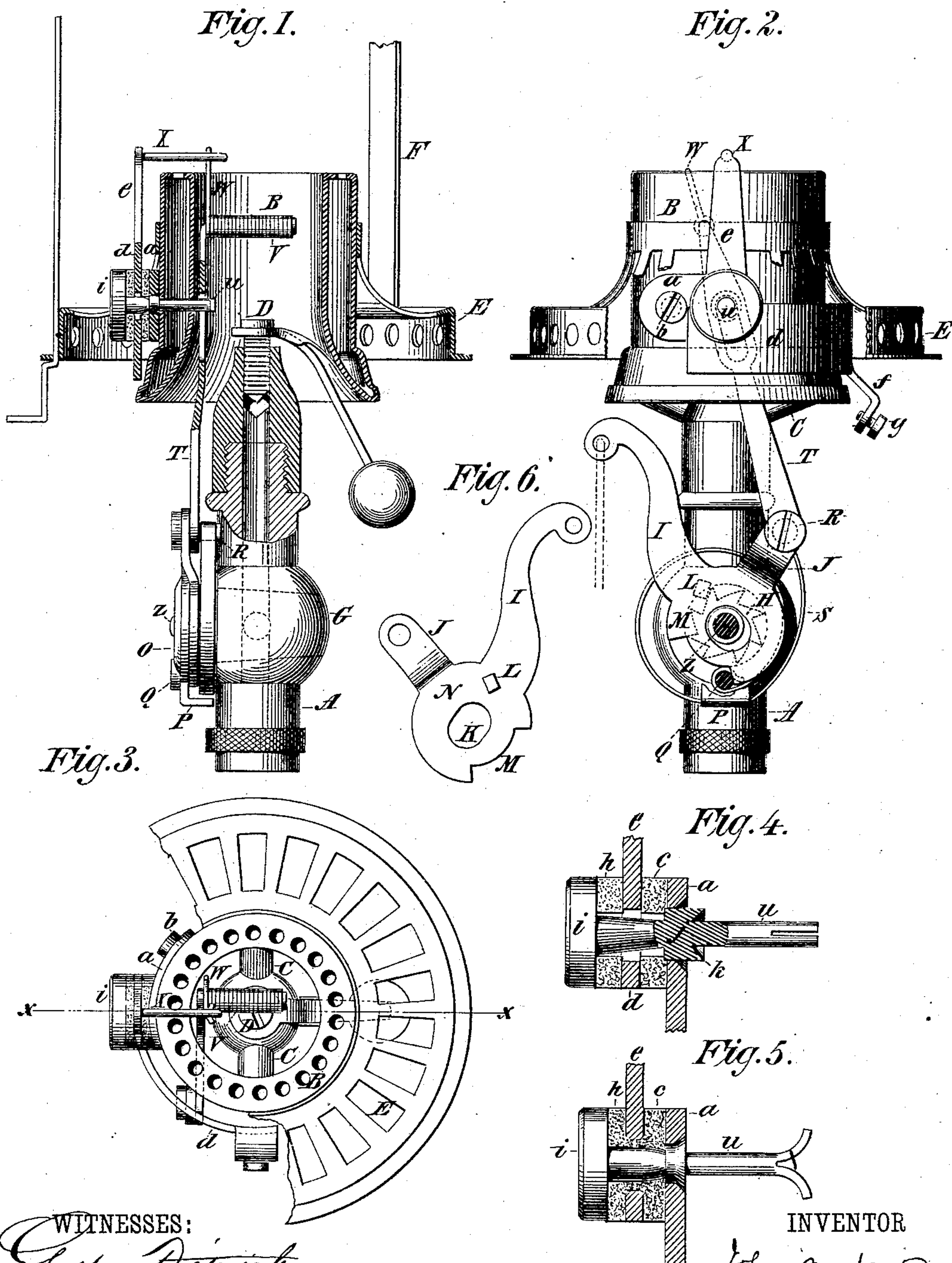
(No Model.)

J. A. NORTON.

ELECTRIC GAS LIGHTING DEVICE.

No. 315,057.

Patented Apr. 7, 1885.



WITNESSES:

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ELECTRIC GAS-LIGHTING DEVICE.

SPECIFICATION forming part of Letters Patent No. 315,057, dated April 7, 1885.

Application filed March 18, 1884. (No model.)

To all whom it may concern:

Be it known that I, JOHN A. NORTON, of Brookline, Norfolk county, Massachusetts, have invented a new and useful Improvement in Electric Gas-Lighting Apparatus, of which the following is a specification.

The invention relates to that class of electric gas-lighting apparatus in which the movement of the mechanism which actuates the stop-cock to turn on the gas is communicated to the movable electrode of a circuit-breaker, whereby sparks are produced to ignite the gas at the escape-orifice.

The invention consists in the arrangement and construction of the circuit-breaking mechanism, and of the fixed electrode adapting the same to an Argand or like hollow burner. It consists, also, in the novel method of constructing the fixed electrode and its insulating-support.

In the accompanying drawings, Figure 1 is a partial vertical section of my improved electric Argand gas-lighting apparatus. Fig. 2 is a side elevation with certain portions broken away. Fig. 3 is a plan view with certain portions removed, and Figs. 4 and 5 are detached views showing the method and means of constructing the fixed insulated electrodes. Fig. 6 is a detail view.

Similar letters of reference indicate like parts.

A is the gas-pipe. B is an ordinary Argand burner, of the usual and well-known construction, communicating with the main gas-pipe by the branch pipes C. In the summit of the gas-pipe is shown a valve, D, for regulating the height of the gas-flame, this valve being also a contrivance in common use in Argand burners.

E is the chimney-ring, provided with clips or spring-arms F, for holding the chimney, and supported upon the burner in the usual manner, as shown.

The gas-valve, which is not shown here in detail, is a conical plug seated transversely in the part G of the gas-pipe, and provided with a suitable duct or ducts for the passage of the gas when the valve is opened. To the valve-stem is rigidly secured a ratchet-wheel, H. (Shown in dotted lines, Fig. 2.) Pivoted on

the stem of the valve outside the ratchet-wheel is a plate, N, having arms I and J and an eccentric slot, K. On the rear side of this plate is a stop-pin, L, and in its lower edge is formed a recess, M. Outside the plate N is a cap-plate or cover, O, having a central aperture to receive the end of the valve-spindle, and a projection, P, through which passes a screw, Q, which enters the body of the gas-pipe and secures the parts of the mechanism thus far described in place. Connected to a pin, R, on the arm J of the plate N is a coiled spring, S, which passes around the ratchet-wheel H, and has its opposite end attached to the screw Q.

It will be seen from Fig. 2 that when the parts thus far described are put together the cock spindle or pivot Z stands in the left-hand end of the slot K of the plate N. The pivot is then central in the plate N, or, in other words, the plate rotating on that pivot will turn about its true center during the beginning of its movement from right to left, as is produced by moving downward the end of the arm I. When the parts are at rest, they are maintained in the position shown by the spring S.

The operation of the gas-cock is as follows: The arm I being moved downward, the stop-pin L engages with the adjacent ratchet-tooth of the wheel H, and thereby rotates the cock to turn on the gas. The movement of the plate N is limited by the shoulder of the recess M meeting the screw Q. When the arm I is released, the plate N is retracted by the spring, and the pin L then meets the inclined side of the adjacent ratchet-tooth. The ratchet-wheel H is, however, rigidly fixed on the gas-cock. The consequence, therefore, is that the pin moves over the inclined tooth, and this is permitted by the elongated slot K in the plate N, which allows of the latter sliding on its pivot Z. The pivot Z then comes into the right-hand end of the elongated slot, so that the plate N is eccentrically pivoted. The result is, first, that the radius of the arm J is shorter on the return or back movement than it is on the forward movement, and, second, that on the forward movement of the plate N and arms I J the cock is rotated with said plate, while on

the return movement the plate is carried back by the spring without moving the cock.

The operation of the gas-cock is therefore as follows: Supposing, for example, that the 5 cock is a two-way cock—that is, that it has two transverse ducts at right angles—it is obvious that at every quarter-turn of said cock the gas will be turned full on; or, in other words, the gas will be admitted and shut off 10 at every one-eighth turn of the cock. The downward movement of the arm I rotates the plate N, so that the stop L thereon turns the cock one-eighth of a revolution. Consequently, the gas being supposed at the outset to be shut 15 off, the first downward movement of the arm I fully opens the cock. The arm being released, the plate N is retracted without moving the cock, and the gas is left turned full on. The next downward pull on the arm I rotates 20 the cock again one-eighth of a revolution in the same direction, thus shutting the gas completely off, and the retraction of the plate N, as before, leaves the parts in their original condition—that is, with the cock closed.

My present application relates to the construction of the circuit-breaking mechanism combined with the above-described cock mechanism, and to its mode of arrangement in combination with an Argand burner. Said circuit-breaking mechanism is connected to the 30 arm J of the plate N, so that the downward movement of the arm I, as already described, not only turns on the gas, but also actuates the movable electrode of the circuit-breaker to produce sparks near the gas-escape orifice, 35 by which sparks the gas is ignited. This part of my invention consists in two portions: first, the movable electrode, and, second, the fixed electrode, both substantially constructed, combined, and arranged, as herein shown and described. 40

Pivoted to the arm J by the pin R is an arm, T, which extends upward within the interior ring of the burner. Near its upper end this 45 arm is slotted to receive a fixed pin, U, which passes through the side walls of the burner. The inner extremity of the pin U is slit and opened, as shown in Fig. 5, to prevent the arm T from becoming displaced therefrom. 50 The upper extremity of the arm T is bent at right angles, and upon this portion is placed a spiral spring, V, one end, W, of which extends upwardly, and forms a yielding elastic contact-point adapted to meet the fixed electrode, which is secured beside the burner, and 55 the terminal X of which is in the form of a bar, which stands transversely across a part of the circular series of gas-escape orifices.

It has already been pointed out that one result of the construction of cock mechanism 60 above described is that on the forward movement of the plate N—that is, when the arm I is moved downwardly—the radius of the end of the arm J is greater than when the plate is 65 retracted by the spring S—this by reason of the shifting of the center of rotation of the

plate N. It follows, therefore, that when the radius of the arm J is increased that of the point or electrode V is also lengthened, and consequently when that point is vibrated it 70 makes and breaks contact with the fixed electrode X. When, however, the radius of the arm J is decreased, then the contact-point V can no longer reach the fixed electrode X, but moves beneath the latter. 75

It will now be apparent that the downward movement of the arm I turns on the gas and moves the contact-point V into and out of contact with the fixed electrode X, and that when 80 said arm is released and retracted by the spring S the contact-point V passes beneath the fixed electrode X. The advantage of this is that during the back movement of the mechanism the circuit in the apparatus is broken, and hence the current is not wasted at that time, 85 and also that the contact-point V does not move through the flame, which would overheat and in time destroy it.

The electric circuit in the apparatus is conducted from the battery to the fixed electrode, 90 and thence when the electrodes are in contact it passes to the contact-point V and arm T, and thence by the gas-pipe to the ground. The fixed electrode must therefore be insulated from the burner, and to effect this result, and 95 also to provide an advantageous mode of support for said electrode upon the burner, I have devised a special construction, which constitutes one of the most important features of this invention. 100

a is a small curved plate of metal, secured to the outer periphery of the burner by a screw, *b*.

c is a washer of asbestos or other insulating material.

d is a curved bar of metal, having formed 105 upon it at right angles a post, *e*, from which projects the fixed electrode X. The bar *d* extends some distance around the burner, but does not touch the same. At its extremity is formed a downward projection, *f*, in which is a set-screw, 110 *g*, for attaching a circuit-wire.

h is another washer, of asbestos or other insulating material. Through the washer *h*, bar *d* at its angle, washer *c*, piece *a*, and through 115 the wall of the burner passes the pin U, which, as already described, serves as a pivot for the slotted arm T. This pin at its outer end is provided with a flat disk-shaped head, *i*.

The arrangement and mode of putting together these parts is illustrated in Figs. 4 and 120 5. They are connected before being applied to the burner in the following manner: The pin U at *j* is enlarged, the front side, *k*, of the enlargement being conically recessed. Between this enlargement and the head *i* the pin 125 is tapered.

I first place upon the pin the washer *h*, pressing it up against the head *i*. In passing over the enlargement the edge of the inner orifice of the washer becomes slightly turned inward. 130 Next to the washer *h*, on the pin U, I place the bar *d*, which has an aperture sufficiently

large to pass over the enlargement *j*, so that there is some space, as shown in Fig. 4, between the edge of the opening in said bar and the pin. Into this space the turned edge of the washer *h* enters when the bar *d* is brought against said washer. Next to the bar *d*, on the pin *U*, I place another asbestos washer, *c*, and finally the small bar *a*. This bar has an aperture which fits snugly over the enlargement *j*. The outer edge of this aperture is countersunk. The parts are then arranged as shown in Fig. 4. I then place the device in a suitable press and force the bar *a* toward the screw-head, thus compressing the intervening parts tightly together, and also in some measure upsetting the pin *U*. Then by any suitable means I rivet down the end of the enlargement *j*, to cause the latter to enter the countersunk portion of the aperture of the bar *a*. In this way all the parts are tightly riveted together, and at the same time the yielding material of the washers is forced into the annular space between the pin *U* and the bar *d*. The bar *d* is thus completely insulated from its supporting device, and the latter is applied to the burner, as already explained, by means of the screw *b*. I have found this contrivance very efficient in practice, and of especial advantage, inasmuch as the insulated electrode and the support can be manufactured entirely independently of the burner and attached thereto as a whole easily and readily.

In other applications for Letters Patent filed simultaneously herewith, and serially numbered 124,603 and 124,605, I have set forth electric gas-lighting devices of analogous description to the foregoing. The inventions claimed in the aforesaid applications are herein disclaimed.

I claim as my invention—

1. In an electric gas-lighting apparatus, the combination of an annular or hollow burner, an insulated fixed electrode secured to the outer wall of and having its contact-point extending above said burner, a movable electrode containing an elongated slot, a pivot-pin passing through said slot and fixed in the wall of the burner, a means of vibrating said electrode in one direction to move it into and out of contact with the fixed electrode, and a means of vibrating said electrode in the opposite direction, and also lowering it to cause it to pass below and out of contact with the fixed electrode, substantially as described.

2. In an electric gas-lighting apparatus, an insulated support and a fixed electrode, and in combination therewith a pin having a broad

head and an enlargement adapted to form a rivet, and upon said pin, first, a washer of insulating material; second, a metal support for the electrode having an enlarged central opening; third, another washer of insulating material, and, fourth, a plate or bar having an opening to receive the enlargement of the pin, the said parts being pressed together, the enlargement of the pin being riveted or expanded in the opening of the last-mentioned plate to bind all parts firmly together, the electrode support being held between the washers and out of contact with the pin, substantially as described.

3. In an electric gas-lighting apparatus, and in an insulated fixed electrode and support therefor, the combination of the pin *U*, having a head, *i*, and rivet-enlargement *j*, washers *h* and *c*, of insulating material, and electrode-support *e*, having an enlarged central opening, and plate *a*, substantially as described.

4. In an electric gas-lighting apparatus, and in an insulated fixed electrode and support therefor, the combination of the pin *U*, having a head, *i*, and rivet-enlargement *j*, washers *h* and *c*, of insulating material, plate *a*, rectangular bar *d e*, having an enlarged opening at or near the angle to receive the pin *U*, and a means of detachably connecting a circuit-wire to said bar, substantially as described.

5. In an electric gas-lighting apparatus, and in an insulated fixed electrode and support therefor, the combination of the pin *U*, having a head, *i*, and rivet-enlargement *j*, washers *h* and *c*, of insulating material, plate *a*, bars *d* and *e*, held upon said pin between the washers, but not touching the pin, electrode *X*, supported by bar *e*, and a means of attaching a circuit-wire to bar *d*, substantially as described.

6. In an electric gas-lighting apparatus, the combination of an annular or hollow burner, a fixed pivot-pin passing through the wall of said burner, a fixed electrode rigidly secured upon said pin and insulated therefrom on the outside of said burner, and a movable electrode pivoted upon said pin on the inside of said burner, substantially as described.

7. In an electric gas-lighting apparatus, the combination of the annular or hollow burner *B*, fixed electrode *e X*, plate *a*, screw *b*, washers *h c*, pin *U*, having a head, *i*, bar *d*, a means of connecting a circuit-wire to said bar, and a movable electrode, substantially as described.

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