

ELECTRIC GAS-LIGHTING APPARATUS.

Patented Dec. 14, 1875.

Fig. 3.

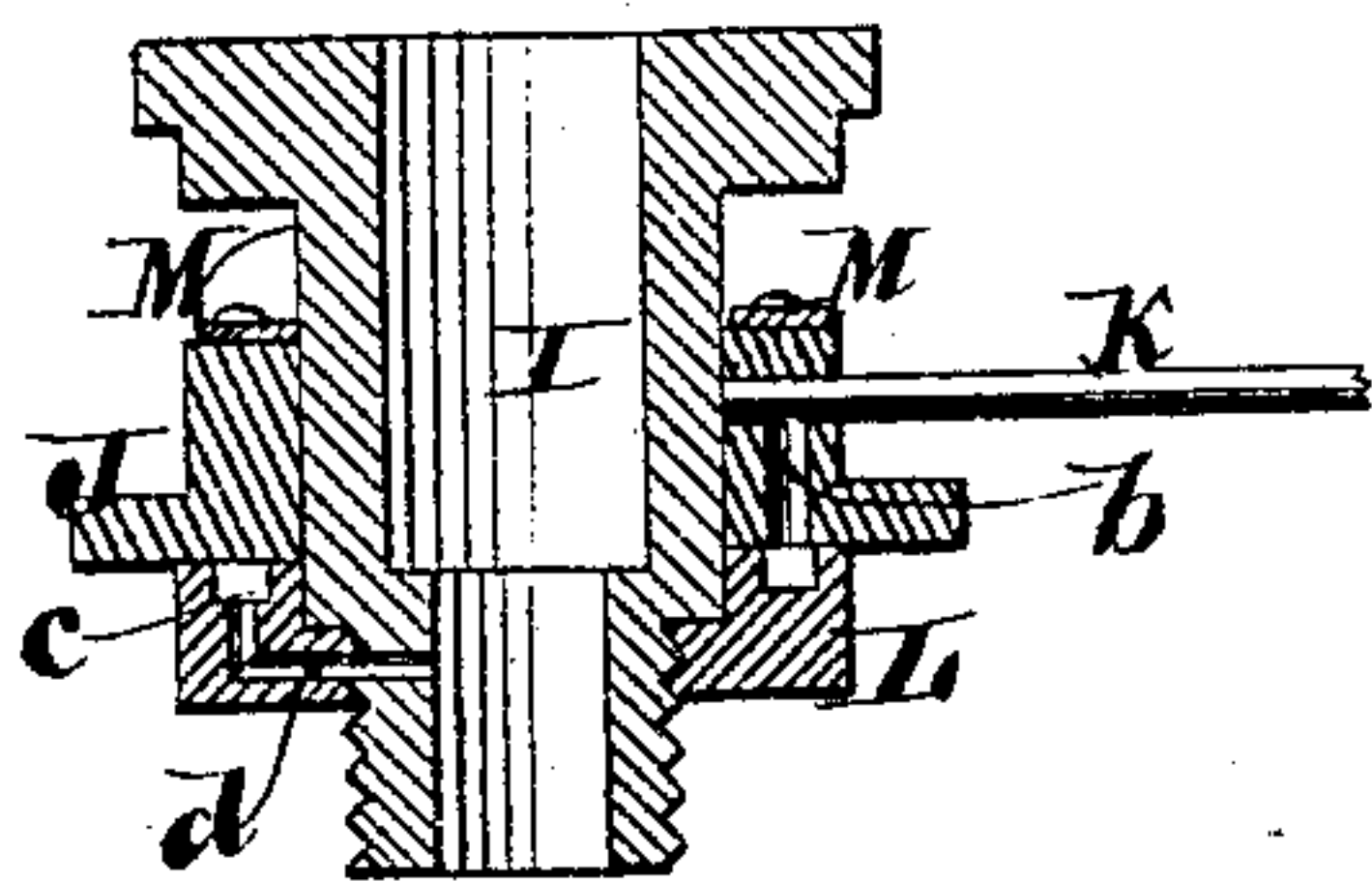


Fig. 4.

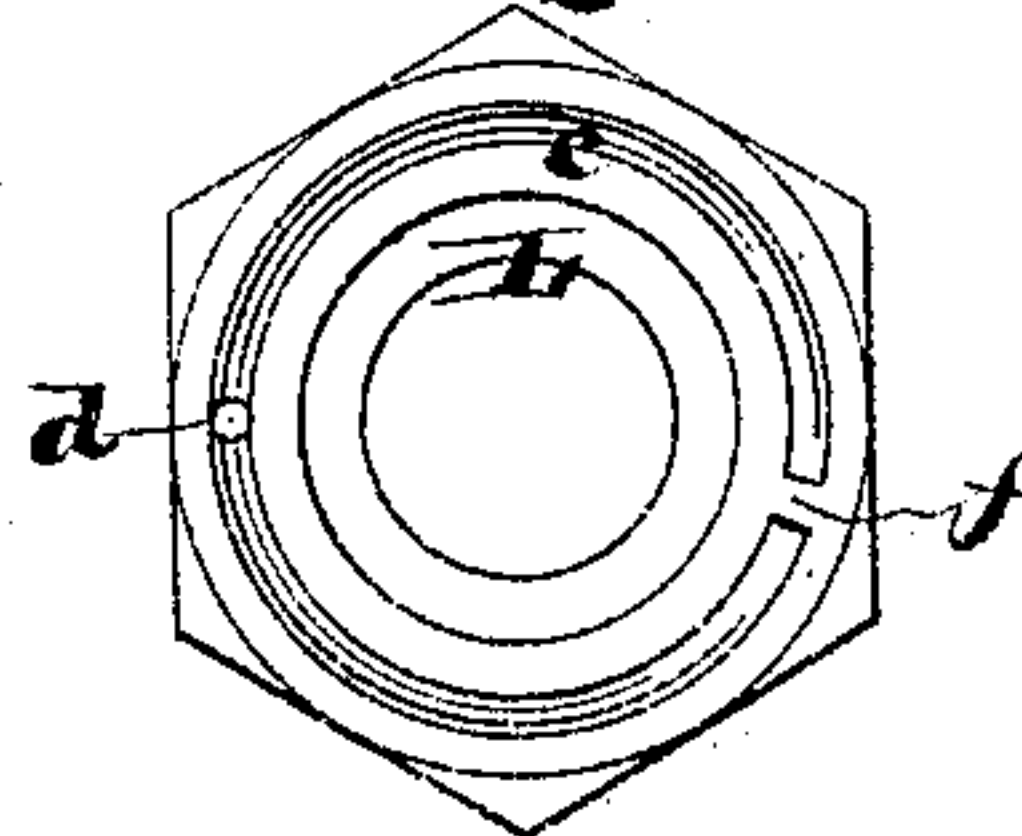
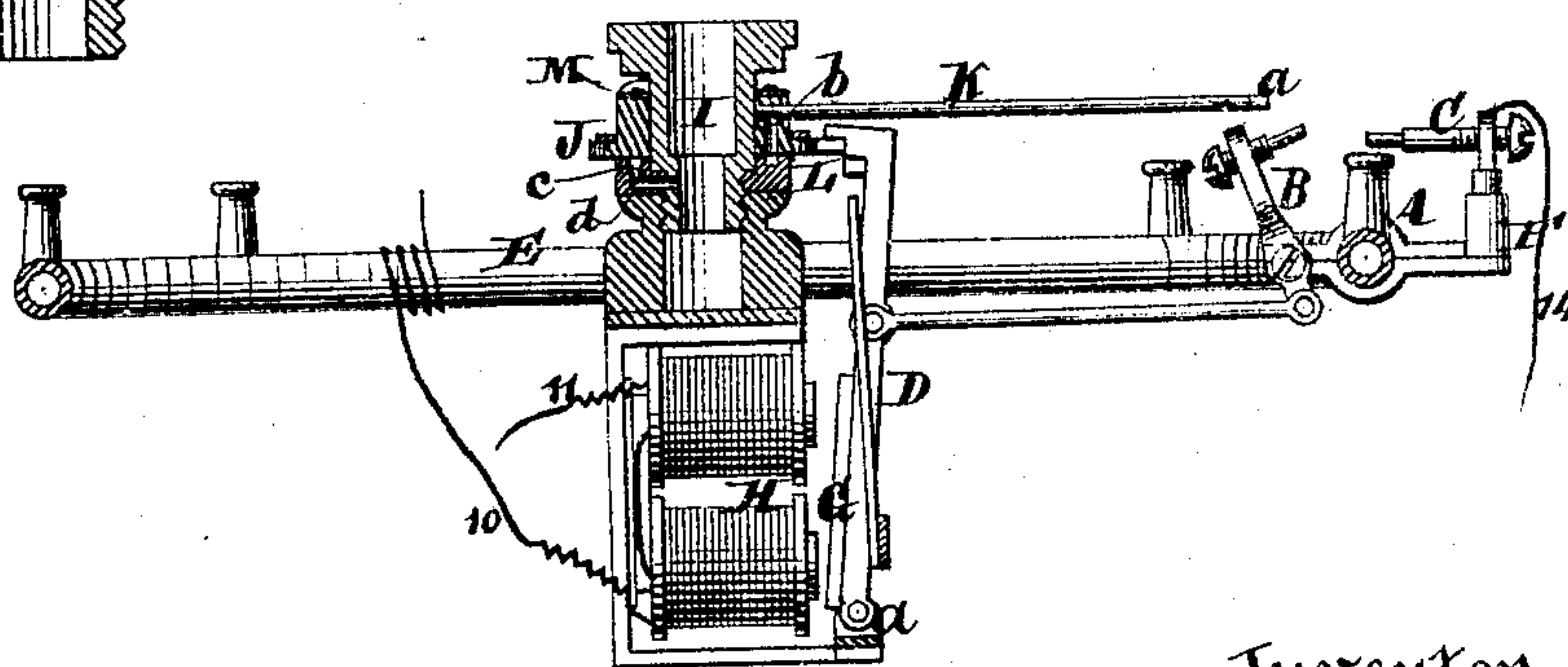


Fig. 2.



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IMPROVEMENT IN ELECTRIC GAS-LIGHTING APPARATUS.

Specification forming part of Letters Patent No. **171,130**, dated December 14, 1875; application filed July 21, 1875.

To all whom it may concern:

Be it known that we, CHARLES H. HINDS and ADOLPH THEODOR SMITH, of city, county, and State of New York, have invented a new and useful Improvement in Lighting Gas by Electricity, which improvement is fully set forth in the following specification, reference being had to the accompanying drawing, in which—

Figure 1 represents a plan or top view of our improvement, partly in section. Fig. 2 is a vertical section in the plane of the line *x x*, Fig. 1. Fig. 3 is a vertical section, showing the connections of the "traveling torch" on a larger scale than in the previous figures. Fig. 4 is a plan view of the connecting-nut.

Similar letters indicate corresponding parts.

Our invention relates to that class of electric gas-lighters in which are combined a vibrating electrode and a stationary insulated electrode, in conjunction with one or more gas-burners.

Our improvement consists in what we term a traveling torch, which is arranged in such a manner, relatively to the electrodes and the gas-burners, that the gas is ignited through the lighting of a single burner by the action of the electrodes, while, by reason of the traveling of the torch, it is adapted to light any number of burners placed in its path.

The manner of imparting motion to the traveling torch consists in attaching it to a ratchet, which is engaged by a pawl connected to the armature of an electro-magnet in such a way that when the circuit is closed through the electro-magnet, and thereby a vibrating motion is given to the armature, the pawl partakes of such motion, and an intermittent movement is imparted to the ratchet and the torch.

The traveling torch is so constructed that it is adapted to burn a gas-flame; and, to this end, it has a gas-supply source, which is composed, in the present example, of a transverse way extending through the ratchet from the point of the torch, with which it communicates, to one of its surfaces, which latter bears against the surface of a nut provided with a groove, which coincides with the transverse way of the ratchet, and to which extends an inlet-orifice from the interior of a tubular stem forming

the support of the ratchet and the nut, and forming the continuation of a gas-pipe, in such a manner that, when the ratchet describes its movement, a continuous supply of gas is kept up to the torch.

With the traveling torch and its gas-supply source is combined an automatic cut-off, of such a nature that it interrupts the supply of gas to the torch at certain periods, and by this means the torch-flame is extinguished.

The automatic cut-off is formed by a break or solid part in the feed-groove, which, when the transverse way of the ratchet comes opposite to it, causes an interruption in the supply of gas to the torch, as hereinafter fully set forth.

In the drawing, the letter A designates a gas-burner, which, in the example shown, forms part of a "ring-light," but which may be arranged in any desirable manner. With this burner are combined two electrodes, B C, the electrode B being connected to a lever, D, which vibrates on a pivot, *a*, and which is in metallic contact with the gas-pipe E, while the electrode C is secured to a stud, F, which is insulated from the gas-pipe. The lever D connecting with the vibrating electrode B is attached to the armature G of an electro-magnet, H, so that when, by the closing of the current through the magnet, said armature is attracted, the point of the vibrating electrode is brought in contact with the point of the insulated electrode, and when the current is broken and the points are allowed to separate a vivid electric spark is produced, which serves to ignite the gas issuing from the burner A. The helix of the electro-magnet H connects at one end by a wire, 10, with the gas-pipe, and through this pipe to the ground, while the other end of the helix connects by a wire, 11, with a key (not shown) which, through suitable intermediate cells, connects by a wire, 14, with the insulated electrode C, and, by depressing the key, the circuit of the galvanic cells is closed through the electro-magnet, and thus an attraction of the armature of the magnet takes place, and the production of an electric spark.

The tubular stem I, that forms the support of the gas-pipe E, contains a ratchet, J, in the form of a wheel, and to this ratchet is con-

nected a radial pipe, K, the end *a* of which forms a torch, the end being open, and the whole being connected with the interior of the stem I, which constitutes a gas-supply source, when attached to a gas-pipe. Combined with the ratchet K is a pawl, L, which is pivoted to the armature-lever D operating the vibrating electrode B, or to a separate lever, and thus, when the armature G is attracted, the pawl partakes of its movement and of the armature-lever, and thereby the ratchet is moved forward to the extent of the movement of the lever, and the torch K is caused to travel with the ratchet.

Now, the torch being supplied with gas and being caused to move by the action of the pawl and ratchet in proximity to the burner A, with which are connected the electrodes B C, the torch is lighted by the flame of the burner, or by the electric spark, as the case may be, and as the torch continues to travel its flame serves to ignite the remaining burners of the ring.

It may be here remarked that the burners, instead of being in a circular form, may be placed in a straight or curved line, in which case the ratchet J is made of a corresponding form, or in the form of a rack, and the torch is given a corresponding movement.

The connection of the torch with the interior of the tubular stem I is effected by means of a transverse passage, *b*, in the ratchet J of a groove, *c*, in the surface of a nut, L, encompassing the tubular stem I, and by means of an orifice, *d*, extending at right angles from the groove *c* through the nut and through the stem I.

When the tubular stem is connected to a gas-pipe, the gas passes through the inlet-orifice *d* to the groove *c*, and, distributing itself throughout this groove, finds its way to the passage *b*, which guides the gas to the torch.

In order to form an air-tight joint between the surfaces of the nut L and the ratchet J, the latter is subjected to the action of springs M, interposed between the ratchet and the head of the tubular stem I.

The continuity of the groove *c* of the nut, Fig. 3, is broken by a solid part, *f*, the size of

which is equal to or greater than the diameter of the passage *b* of the ratchet, and when, in the movement of the latter, this passage *b* comes opposite to the break *f*, the supply of gas to the torch K is cut off and the torch-flame is extinguished. The break *f* thus forms an automatic cut-off, and it is so disposed relatively to the position of the torch and the gas-burners that the extinguishment of the torch takes place at the completion of its movement, or, in other words, after all the burners have been ignited.

Immediately next to the point at which the traveling torch is extinguished, the ratchet has a depression, *g*, Fig. 1, the object of which is to permit of a movement of the armature G and of the electrodes B C, sufficient to cause the points of the latter to come in contact, in contradistinction to the remaining part of the ratchet, which is so formed as to prevent such movement, and to obviate the production of an electric spark at every movement of the torch.

What we claim as new, and desire to secure by Letters Patent, is—

1. In an electric gas-lighter, a traveling torch, K, adapted to operate in conjunction with electrodes B C, substantially as described.

2. A traveling torch K, combined with a gas-supply source and with electrodes B C, substantially as described.

3. The combination of a pawl, L, ratchet J, armature G, and electro-magnet H, with the traveling torch K, substantially as described.

4. In combination with the traveling torch K, a gas-supply source composed of the way *b*, groove *c*, and orifice *d*, substantially as described.

5. The cut-off *f*, constructed as described, in combination with the traveling torch K, the groove *c*, way *b*, and orifice *d*, substantially as set forth.

In testimony that we claim the foregoing, we have hereunto set our hands and seals this 19th day of July, 1875.

CHAS. H. HINDS. [L.S.]

ADOLPH THEODOR SMITH. [L.S.]

Witnesses:

W. HAUFF,

E. F. KASTENHUBER.