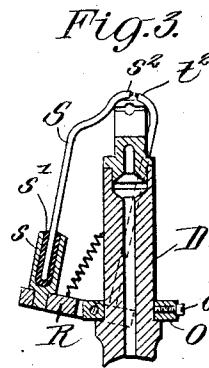
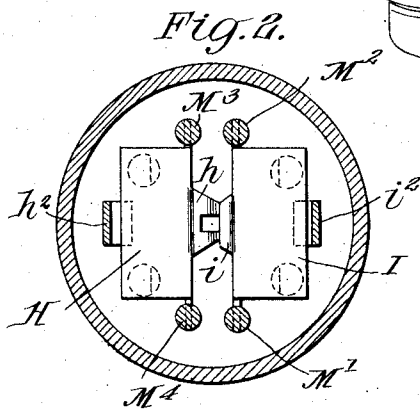
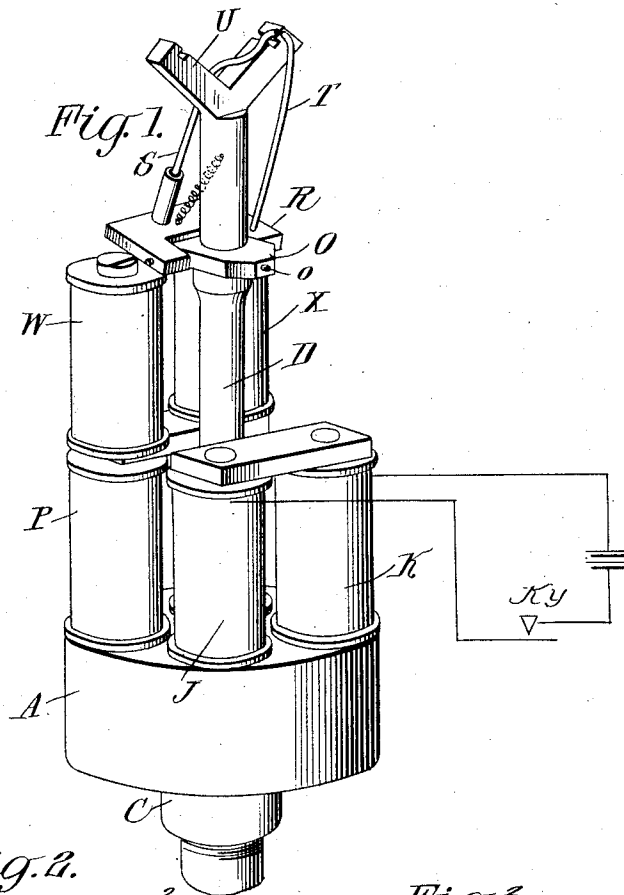


J. S. BENTON.  
ELECTRIC GAS LIGHTING AND EXTINGUISHING APPARATUS.  
APPLICATION FILED JULY 16, 1910.

1,025,047.

Patented Apr. 30, 1912.

2 SHEETS—SHEET 1.



WITNESSES  
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Fig. 5.

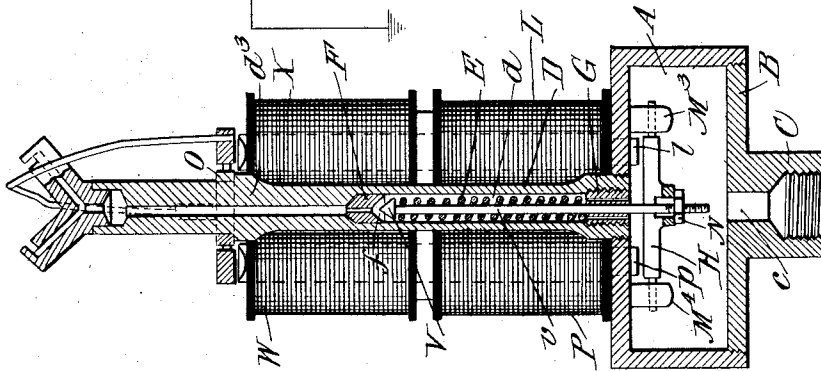


Fig. 4.

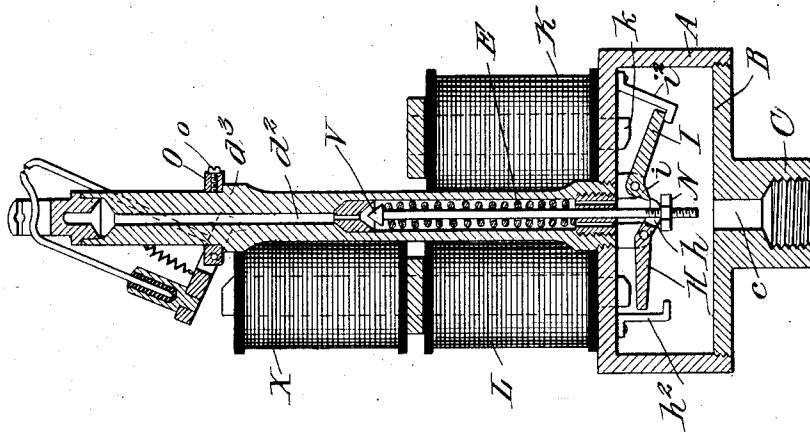
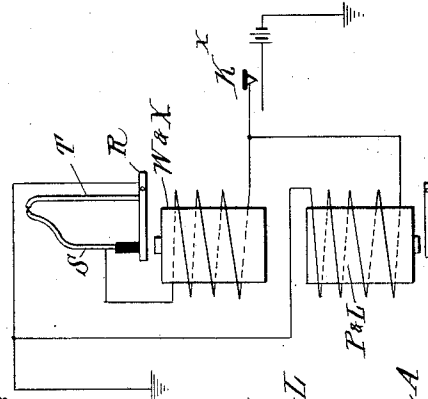


Fig. 6.



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# UNITED STATES PATENT OFFICE.

JOSIAH SAMUEL BENTON, OF JOHNSTOWN, PENNSYLVANIA, ASSIGNOR TO THE IDEAL  
EPWORTH ACETYLENE COMPANY, OF JOHNSTOWN, PENNSYLVANIA, A CORPORATION OF PENNSYLVANIA.

ELECTRIC GAS LIGHTING AND EXTINGUISHING APPARATUS.

1,025,047.

Specification of Letters Patent.

Patented Apr. 30, 1912.

Application filed July 16, 1910. Serial No. 572,240.

*To all whom it may concern:*

Be it known that I, JOSIAH S. BENTON, a citizen of the United States, and a resident of Johnstown, in the county of Cambria and State of Pennsylvania, have made certain new and useful Improvements in Electric Gas Lighting and Extinguishing Apparatus, of which the following is a specification.

My invention relates to electrical means for lighting and extinguishing gas lights and it consists in the combinations, constructions and arrangements herein described and claimed.

The main object of my invention is to provide a gas lighting and extinguishing apparatus, the workable parts of which are inclosed in the gas chamber itself, thereby eliminating the necessity of providing an opening which must be made gas tight, and which at the same time must be lubricated.

A further object of my invention is to provide an electro-magnetic device which consumes a relatively small quantity of electrical energy in its operation.

Other objects and advantages will appear in the following specification and the novel features of the device will be particularly pointed out in the appended claims.

My invention is illustrated in the accompanying drawings in which—

Figure 1 is a perspective view of the burner; Fig. 2 is a detail view showing a section through the gas chamber; Fig. 3 is a section through a portion of the upper part of the burner; Fig. 4 is a central vertical section through the burner, and Fig. 5 is a central vertical section at right angles to Fig. 4. Fig. 6 is a diagrammatic view of the circuit connections for operating the lighting device.

In carrying out my invention I provide a hollow cylindrical casing A made of non-magnetic material (such as brass), which constitutes the gas chamber and which contains certain of the working parts of the device. The bottom of the chamber A consists of a circular plate B having a downwardly extending portion C which is threaded to receive the end of a gas pipe and which is provided with an opening *e* which communicates with the interior of the chamber.

A post or pipe D is screwed into the central part of the top of the casing A. This

post is cored out at *d* and a spiral spring E is placed therein. At the upper end of the cored out portion *d* there is a valve-seat F having a conical recess *f* at its lower end. Screwed into the lower end of the post or tube D is a bushing G which serves as a guide for the valve stem *v*, and also has a bearing for the end of the spiral spring, the upper end of the spiral spring being in contact with the valve V. The valve V is at the upper end of the valve stem, while the lower end of the valve stem is threaded to receive the nut N. The upper part of the tube D has a reduced bore *d*<sup>2</sup> leading to the burner tip.

Projecting downwardly from the under side of the top of the casing A are four arms M', M<sup>2</sup>, M<sup>3</sup> and M<sup>4</sup>, see Figs. 5 and 2. Pivoted between the arms M<sup>3</sup> and M<sup>4</sup> is an armature H. Another similar armature I is pivoted between the arms M' and M<sup>2</sup>. The armature H is provided with a yoke *h* on one side, between the arms of which the valve stem *v* is arranged to extend. The ends of the arms are arranged to be engaged by an extension *i* of the armature I, see Figs. 4 and 2. The movement of the armatures H and I is limited by a pair of stops *h*<sup>2</sup> and *i*<sup>2</sup> which are secured to the casing.

Disposed above the casing A and resting thereon are the four magnets J, K, L, and P respectively. The ends of the cores *p* and *l* project into the casing A in close proximity to the armature H as shown in Fig. 4 while the cores *j* and *k* of the magnets J and K are likewise immediately adjacent to the armature I.

On the exterior of the tube D toward the upper end thereof is a shoulder *d*<sup>3</sup> upon which rests a block O which is secured to the tube by means of a set screw *o*. Pivotaly attached to the block O is a U-shaped armature R. The armature R bears two contact arms S and T respectively. The former is mounted in a socket *s* which carries insulating material *s'* into which the end of the arm S is secured, the socket *s* being secured in its turn to the armature R as clearly shown in Fig. 3. The contact members S and T are made of spring metal and are provided with contact points *s*<sup>2</sup> and *t*<sup>2</sup> of platinum or other suitable material. These contact points being normally held together under the tension of the springs.

In the top of the tube or post D is secured the burner tip U which in the present instance I have shown as arranged for use of acetylene gas but it will be understood that any kind of inflammable gas may be used. In the normal position of the armature R the arms S and T are so disposed as to hold the contact points  $s^2$  and  $t^2$  together and outside the area of gas or flame. When the magnets W and X are energized, however, the arms are brought into the gas area striking against the burner tip. The arm T is forced away from the arm S by the tip thereby creating a spark which ignites the gas.

The magnets L, P, X and W are connected in parallel on the same circuit. One terminal of each of these sets of magnets being grounded. The contact arms S and T are in series with the magnets X and W. The magnets J and K are on a separate circuit.

From the foregoing description of the various parts of the device the operation thereof may be readily understood.

In lighting the gas the key or button  $K^*$  completing the circuit of the magnets L, P, X and W and the sparking device is closed. The attraction of the armature H forces the valve stem and the valve V downwardly by the engagement of the yoke  $h$  with the nut N on the valve stem. At the same time the projection  $i$  on the armature I rides over the end of the arms  $h$  thereby locking the armature in its shifted position as shown in Fig. 4. The magnets X and W are energized thereby attracting the armature R. The engagement of the arm T with the burner tip forces it apart from the arm S due to the bending of the arm T thereby generating a spark and lighting the gas. As soon as the arms S and T are separated the circuit through the magnets X and W is broken (see Fig. 6) and the armature R under the influence of a suitable spring assumes its normal position. As soon as the contacts are brought together again the circuit is reestablished and the magnets X and W again attract the armature R. Thus a vibratory movement of the armature is maintained as long as the lighting key is kept closed. At the cessation of the pressure on the lighting key the armature R is drawn up into its normal position in which the contact arms S and T are without the area of the flame.

In order to extinguish the light it is only necessary to press the button  $K^*$  in the circuits of the magnets J and K. These mag-

nets attract the armature I which springs upwardly, the extension  $i$  rides off of the ends of the yoke  $h$  permitting the armature H to fall down and the valve V to close under the influence of the spring E.

I claim:

1. In an electric gas lighting and extinguishing apparatus, a gas chamber comprising a casing, a hollow post mounted upon the top of said casing, a valve seat in said post, a valve, and a valve stem disposed in the interior of said post, a spiral spring for maintaining the valve normally in a closed position, one end of said valve stem extending into said gas chamber and being provided with an adjustable nut, a pair of armatures disposed within said gas chamber, one of said armatures being arranged to straddle said valve stem and to engage said nut, the other of said armatures being provided with an extension arranged to engage the first named armature to lock it in its shifted position, a magnet secured to the exterior of said gas chamber for operating the first named armature and a magnet secured to the exterior of said gas chamber for operating the second named armature and causing the release of the first one.

2. In an electric gas lighting and extinguishing apparatus, a gas chamber comprising a casing, a hollow post mounted upon the top of said casing, a pair of magnets mounted upon the top of said casing in close proximity to said hollow post, the cores of said magnets extending through the top of the casing, an armature for said magnets disposed within said casing adjacent to said magnet cores, a second pair of magnets mounted on the opposite sides of said posts, the cores of said second pair of magnets also extending through the top of the casing, an armature for said second pair of magnets disposed within said casing in close proximity to said cores, a valve, and a valve stem disposed in the interior of said post, a bushing at the bottom of said post for guiding the valve stem, a spiral spring disposed about said valve stem, the lower end of the spiral spring bearing against said bushing and the upper end against the valve, one of said armatures being arranged to operate said valve stem and the other of said armatures serving as a locking member for said first-named armature.

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Witnesses:

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