

(No Model.)

L. M. KILBURN & S. VAN ETEN.
ELECTRICAL GAS LIGHTER.

No. 488,012.

Patented Dec. 13, 1892.

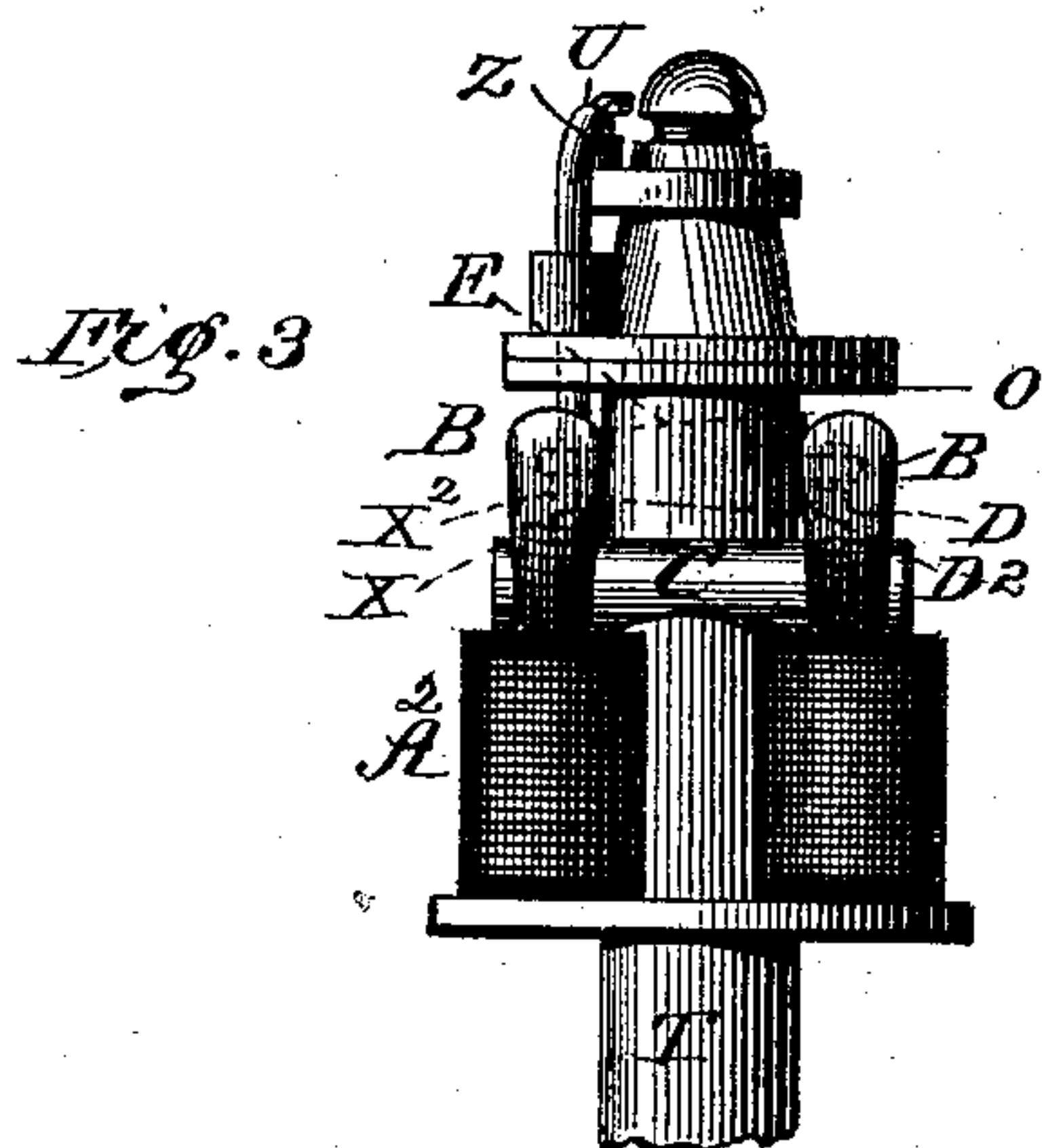
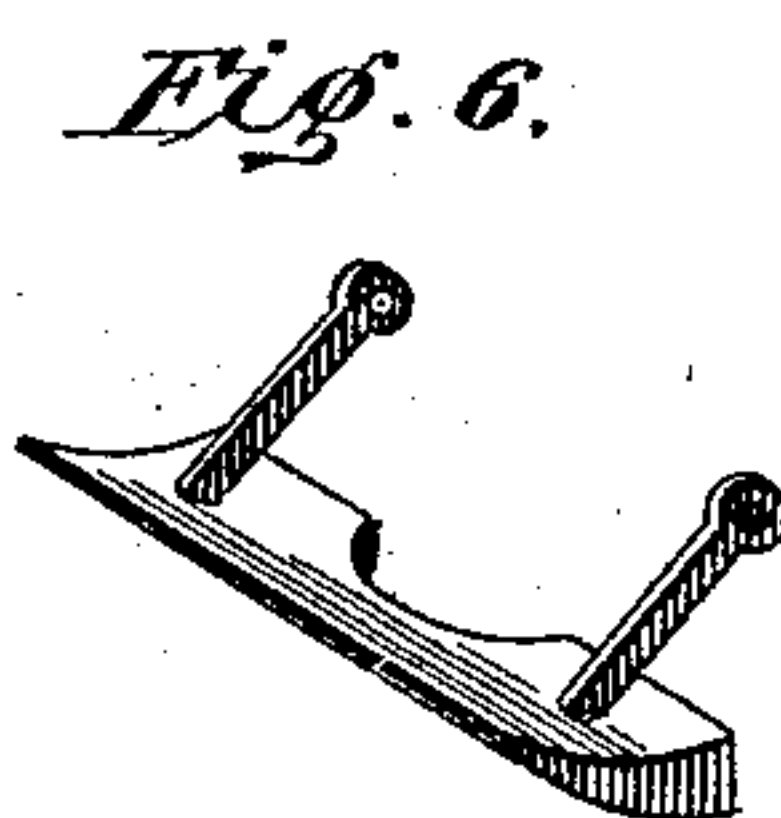
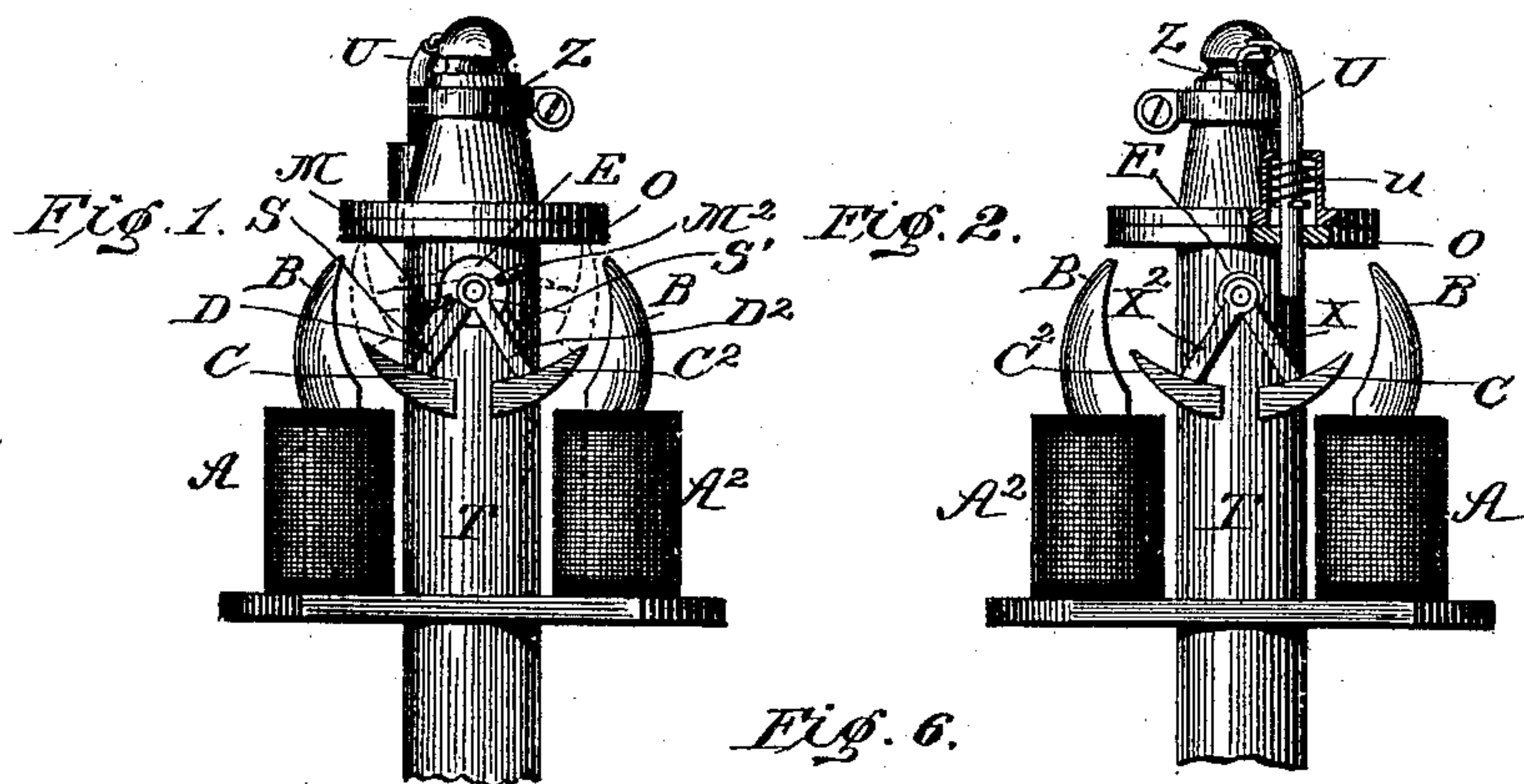
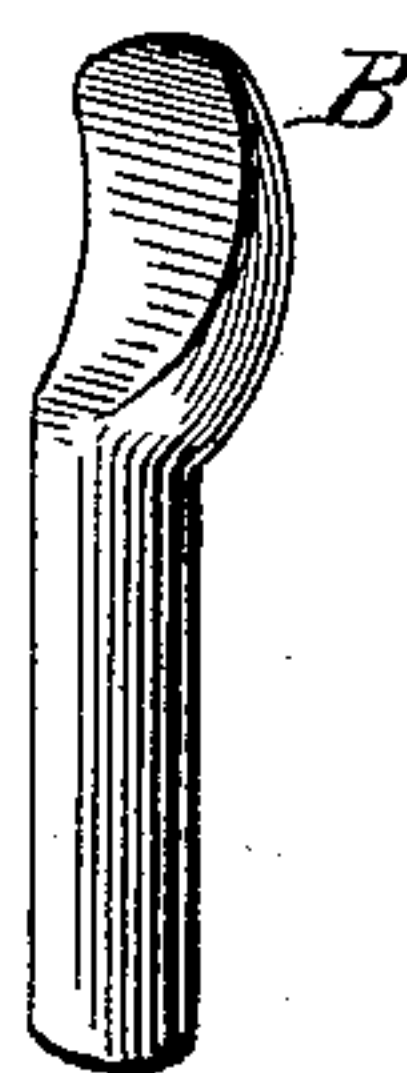
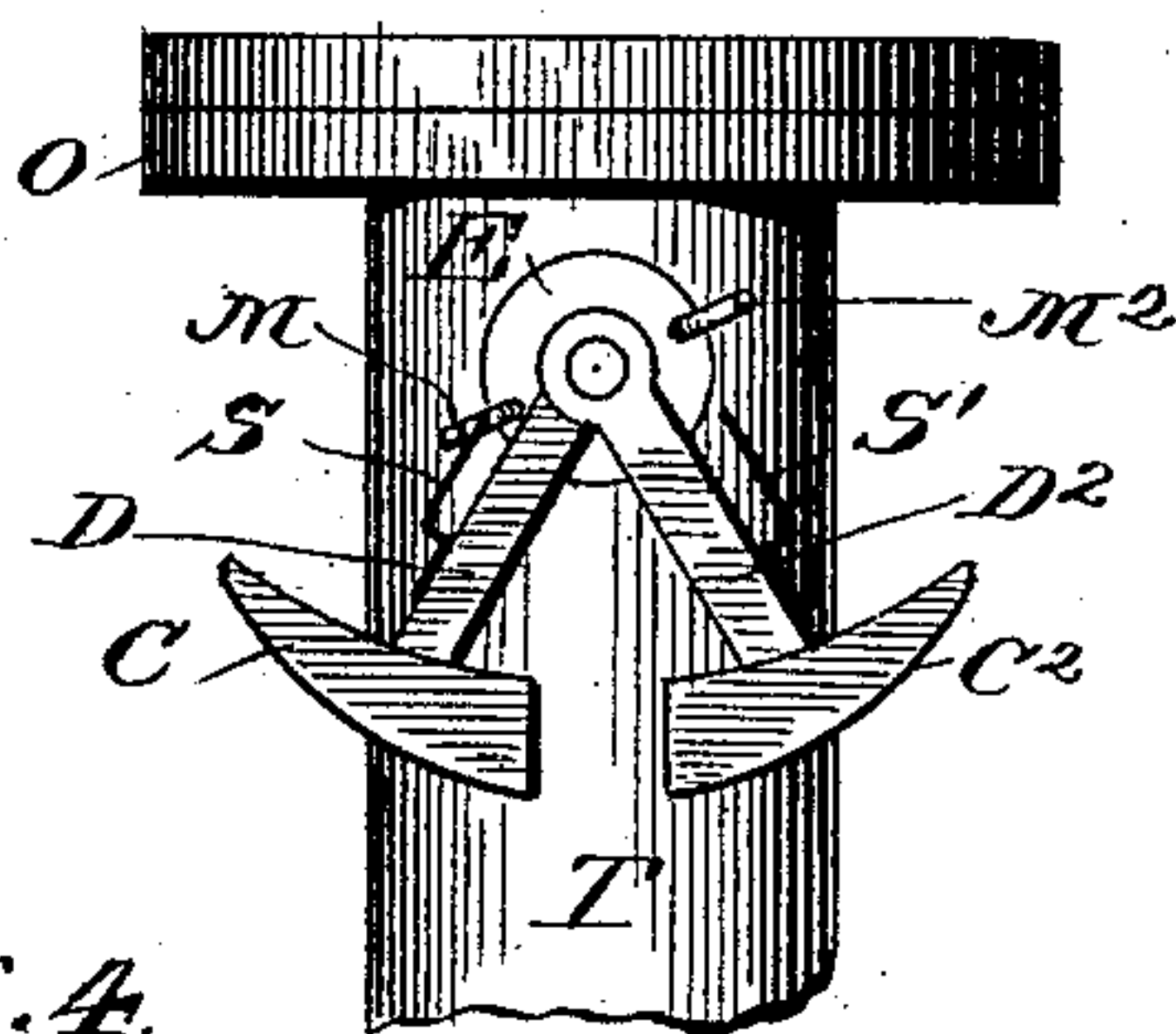


Fig. 5.



WITNESSES:

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ELECTRIC GAS-LIGHTER.

SPECIFICATION forming part of Letters Patent No. 488,012, dated December 13, 1892.

Application filed March 21, 1892. Serial No. 425,806. (No model.)

To all whom it may concern:

Be it known that we, LUCIEN M. KILBURN, residing at Council Bluffs, in the county of Pottawattamie, State of Iowa, and SCOTT VAN ETTEN, residing at Omaha, in the county of Douglas, State of Nebraska, have invented certain new and useful Improvements in Automatic Gas-Lighters, of which the following is a specification.

Our invention relates to that class of automatic electric gas lighting and extinguishing burners in which an oscillating gas-valve in the gas-tube is opened and closed by means of armatures and levers operated by means of electro-magnets, and in which an electric-sparking device is used to ignite the gas when the valve is turned to allow the gas to escape. The objects of our improvements are, first, to provide a burner constructed to have greater efficiency, capacity, and certainty in its operation than any now in use; second, to utilize the electro-mechanical action to the best advantage in its application to moving levers to operate said gas-valve and spark device; third, to obviate all danger of leakage of the gas through said valve and burner; fourth, to construct a burner in which electro-magnets having long range of movement are utilized to move armatures and levers to operate said valve and sparking device.

With other minor objects in view our invention consists in the peculiar combination and arrangement of parts, all of which will be fully described in the specification, and pointed out in the claims, reference being had to the accompanying drawings, in which—

Figure 1 is a side view of our improvement as seen from the valve-operating side. Fig. 2 is a similar view as seen from the opposite side. Fig. 3 is a similar view at right angles to Figs. 1 and 2. Fig. 4 is a perspective detail view of one of the electro-magnet cores. Fig. 5 is an enlarged side view of the base of the valve and the operating-levers; and Fig. 6 is a detail perspective view of one of the armatures and its supporting-levers.

Referring to the accompanying drawings, A A² indicate the electro-magnets, which have the peculiar elongated curved and flattened poles B, the inner curved faces of which are

the arcs of a circle, whose center is below the center of the end of the valve E, the peculiar form of such cores or poles being clearly shown in Figs. 1 and 5.

The armatures C C² are attached to the levers D D² X X², independently suspended at their upper end upon the removable pins forming polar projections of the axis of the valve E, and such levers are the radii of a circle of which the point at the center of end of valve E is the center and the faces of the armatures C C² are arcs. When the electro-magnet A is energized, it raises the armature C in an upward circular direction (in opposition to gravity) and brings the lever D in direct contact with a projecting pin M on the valve E through the medium of a yielding contact, preferably a spring S, as shown, which operation serves to rotate the valve E through a definite arc and bringing its aperture in register with the escape-opening in the gas-tube T, thereby allowing the gas to escape.

Z indicates the fixed electrode, and U the movable electrode, which is held for vertical movement in guides on the face of the burner-tube, and which is normally held in contact with electrode Z, through the medium of a spring u. By reference to Fig. 2 it will be seen that the lower end of the arm or electrode U projects down and rests normally in the path of the swinging lever X, which lever when the armature C is raised, as before described, serves to raise the electrode-arm U vertically, thereby separating the contacts and producing a spark which ignites the gas, this operation of the armatures and levers being automatically repeated as often as an electric current passes through the magnet A and the contacts of the electrodes. When the electro-magnet A² is energized, the armature C² is drawn up in the same manner as above described for the armature C, which operation brings the lever D² in indirect contact through the spring S' with the pin M² on the valve E, and arranged diametrically opposite the pin M, and thereby rotating the valve in a reverse direction back to its normal or closed position and shutting off the gas.

It will be noticed from the foregoing that when the armatures C C² are operated they

describe an arc of the same circle, the limiting-points of which are the gas-tube T, against which they normally rest, and the flange O, which they strike when drawn up to the extremities of the poles D of the magnets A A², such points being covered with felt or other suitable material to deaden the sound. In the levers D D² the pin at the center of the valve E is their fulcrum, the projecting pins M M² the weight, and the armatures C C² the power, thus making the power from the armatures to the center-pin and the weight-arm from pins M M² to the same pin. The object of the levers X X² is to form an equal support for the armatures at each end, though the lever X acts as a positive lever for elevating the arm U to produce the spark. The projections M M² on the base of the valve E are so arranged that when the levers D D² are raised by the armatures, one at a time, such levers act on the said projections to alternately open and close the valve, and by providing the spring-contacts S S' allows for a gradual application of the upward pull of said levers, the pins M M², and the valve E, thus allowing the armatures and their levers to gain sufficient momentum to easily overcome the inertia and initiatory friction of the valve and arm U, and also when the armatures and their levers have attained their full range of movement to rotate the valve a little farther by restoring the energy imparted to the said springs by compression at the commencement of movement. If desired, the springs may be omitted.

The above-described construction of electro-magnets, armatures, levers, supports, and pivots is such as to secure a long mechanical movement of the armatures, the magnetic attraction being the greatest at their normal position and gradually decreasing in amount as the armatures are raised, thus allowing the armatures to start in an advantageous position, and also rendering the pull on them practically uniform during their entire range of movement.

Having thus described our invention, what we claim, and desire to secure by Letters Patent, is—

1. In an automatic electric gas lighter and extinguisher, in combination, an oscillating gas-valve, two independently-acting armatures, levers pivotally suspended from and by polar projections of the axis of said gas-valve, one armature and lever acting to open the gas-valve and operate the sparking device, the other armature and lever acting to close

said valve, two independently-excitably electro-magnets, one to operate each of said armatures and levers, said electro-magnets having long curved poles of the form described and shown, as and for the purpose set forth.

2. An automatic electric gas-lighter comprising a cut-off valve, the lighting and extinguishing electro-magnets, their polar extensions having their inner faces curved on an arc eccentric to the axis of the valve, armatures independently suspended from axial extensions on the valve and having their outer contact-faces curved on an arc concentric to the valve-axis, substantially as and for the purpose described.

3. The combination, with tube T, the magnets A A², the valve E, the armatures C C², the armature supports or levers D D² X X², the fixed electrode Z, the movable electrode U, having its lower end arranged to be engaged by the swinging lever X, said valve E having diametrically-oppositely-arranged projections M M², all arranged substantially as shown, whereby the alternate energizing of the magnets A A² will alternately rock the valve to open up and close off the gas-supply and operate the spark-electrode U, as set forth.

4. The combination, in an electric gas-lighter of the kind described, the rotatable valve, the alternately-operated electro-magnets having their poles extended and curved on their inner face, swinging armatures independently suspended on the axial extensions of the valve, said armatures arranged to swing in an arc eccentric to the curve of the extended poles and having their greatest attraction at the beginning of their movement and the least at the end of their movement, substantially as and for the purpose described.

5. In an electric-lighting apparatus, as described, the combination, with the gas-burner tube T, having a flange O, of the electro-magnets A A², the valve E, the armatures C C², the levers D D² X X², pivoted on the axial extensions of the valve, said armatures held to normally engage the tube T and the flange O when swung up, said tube and flange having sound-deadening means at such contacts, all as and for the purpose described.

In testimony whereof we affix our signatures in presence of two witnesses.

LUCIEN M. KILBURN.
SCOTT VAN ETEN.

Witnesses:

DAVID VAN ETEN,
THEODORE GALLIGHER.