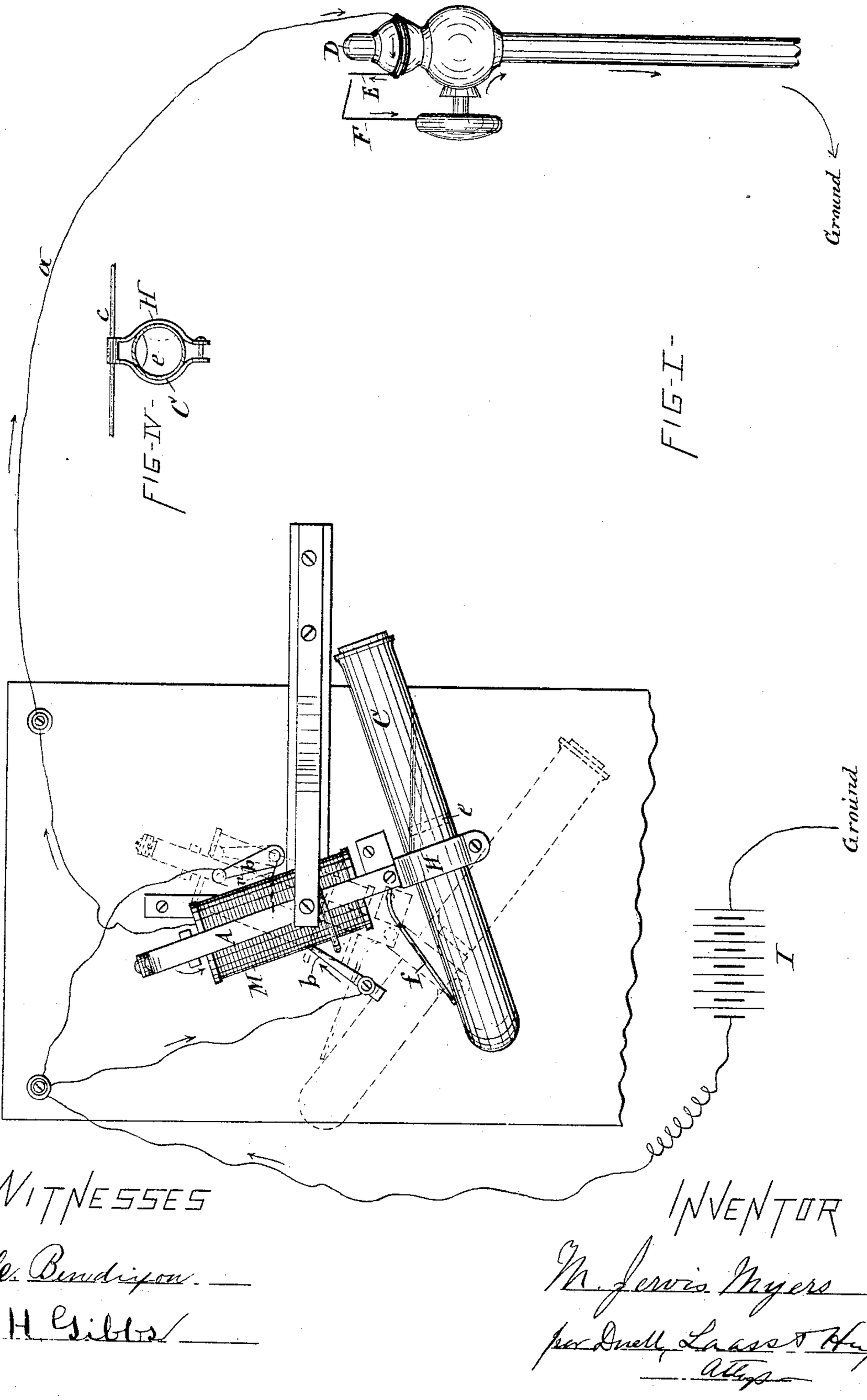
(No Model.) 2 Sheets—Sheet 1.

M. J. MYERS.

AUTOMATIC CIRCUIT BREAKER AND CLOSER.

No. 332,420. Patented Dec. 15, 1885.



WITNESSES

Le. Bendixon.

J. H. Gibbs

INVENTOR

M. Jervis Myers

per Duell, Lacey & Hay

Attys

(No Model.)

2 Sheets—Sheet 2.

M. J. MYERS.

AUTOMATIC CIRCUIT BREAKER AND CLOSER.

No. 332,420. Patented Dec. 15, 1885.

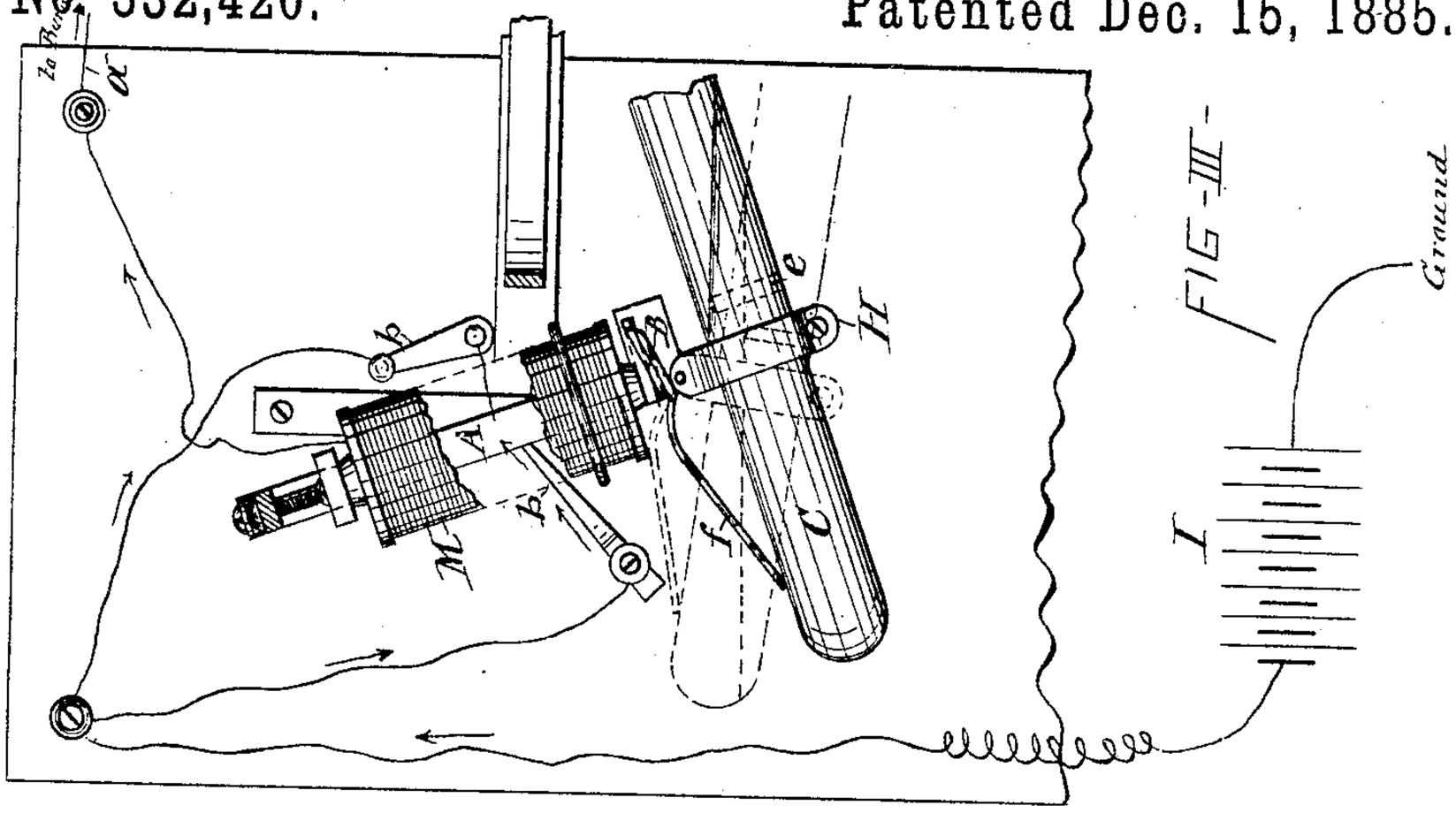


FIG. III.

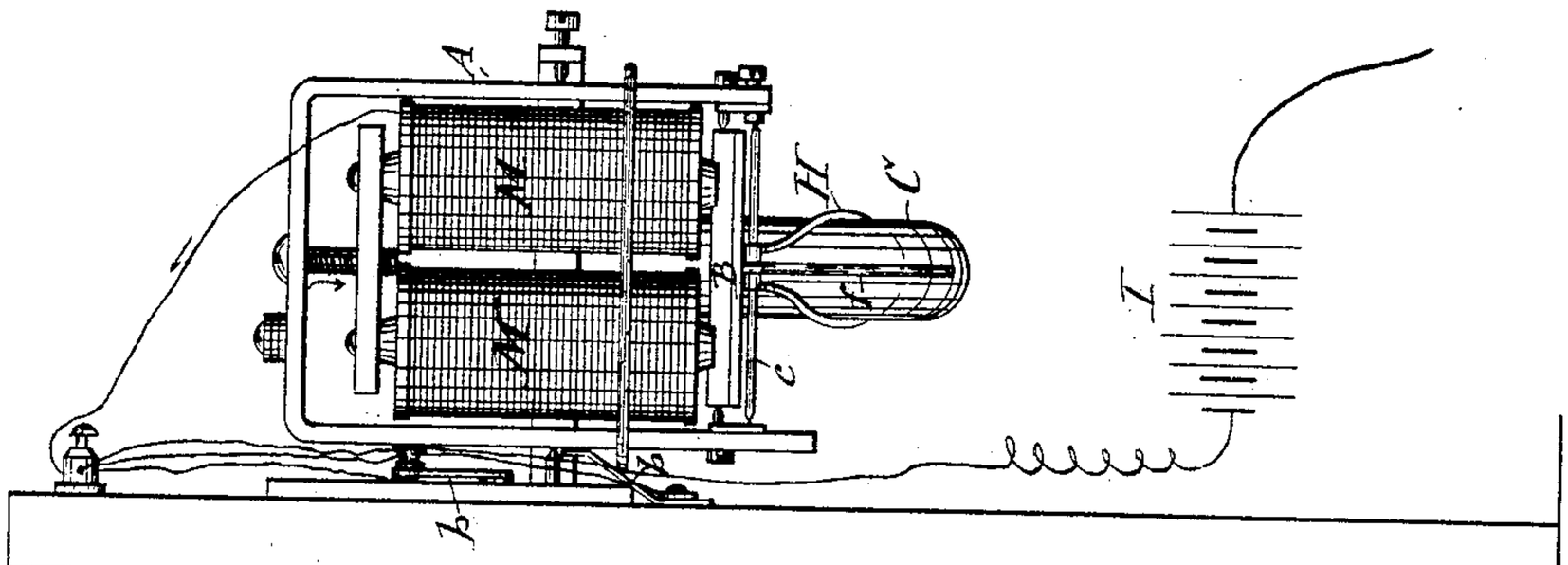


FIG. II.

WITNESSES:

C. Bendixon

F. H. Gibbs

INVENTOR:

M. Jervis Myers

per Church, Sumner & Hopkins

Attys

UNITED STATES PATENT OFFICE.

M. JERVIS MYERS, OF SYRACUSE, NEW YORK.

AUTOMATIC CIRCUIT BREAKER AND CLOSER.

SPECIFICATION forming part of Letters Patent No. 332,420, dated December 15, 1885.

Application filed June 25, 1885. Serial No. 169,729. (No model.)

To all whom it may concern:

Be it known that I, M. JERVIS MYERS, of Syracuse, in the county of Onondaga, in the State of New York, have invented new and useful Improvements in Automatic Electric Circuit Breakers and Closers, of which the following, taken in connection with the accompanying drawings, is a full, clear, and exact description.

In the electric gas-lighters at present in use the requisite spark for igniting the gas is produced by a stationary electrode arranged near the tip of the gas-burner and an electrode attached to the gas-cock and brought into contact with the stationary electrode by the turning of the cock in turning on the gas. In the use of such apparatus it has been found that the electric wire running to the burner is liable to become grounded, either by accidental contact of said wire with the gas-pipe or with various other conductors leading to the ground, or by the two electrodes becoming so caught on each other as to retain them in contact, and such constant grounding of the electric current causes rapid exhaustion of the battery.

The object of my invention is to obviate this injurious effect; and to this end the invention consists in the novel construction and combination of devices which automatically actuate the circuit-breaker, as hereinafter fully described, and specifically set forth in the claims.

In the annexed drawings, Figure I is a side elevation of my invention. Fig. II is a front view of the same. Fig. III is a detail view showing more fully the construction and combination of the parts and the operation of the same, and Fig. IV is a detached transverse sectional view of the adjustable tubular lever.

Similar letters of reference indicate corresponding parts.

D represents the gas-burner. E is the stationary electrode secured to the said burner. F is the movable electrode attached to the gas-cock, so as to be brought in contact with the electrode E automatically with the turning of the cock in turning on the gas, said contact making the ground-connection through the gas-cock and gas-pipe, and producing the requisite spark for igniting the gas issuing from the tip of the burner.

I denotes the battery.

At a suitable location between the battery and gas-burner I employ my improved automatic circuit-breaker, which consists of the following combination of devices: The circuit-breaker proper consists of a metallic yoke or frame, A, which is pivoted to oscillate in a vertical plane. A contact-point, *b*, having connected to it the end of a wire extending from the battery I, is arranged in such a position as to be encountered by the yoke A when in one of its positions of rest. Said contact-point may either consist of a metal spring-arm, as shown at the left-hand side of Figs. I and III of the drawings, or consist of a pivoted key, the free end of which swings to and from a metallic button holding the end of the aforesaid wire, and also electrically connected with the yoke A, as shown at *n* at the right-hand side of the aforesaid figures of the drawings. In the yoke A are secured electro-magnets M, which receive the electric current through the said yoke when colliding with the contact-point *b*. Beneath the magnets is pivoted the armature B, as shown in Figs. II and III of the drawings, and under the armature is pivoted a tubular lever or elongated tube, C, which is partly charged with a suitable fluid, or any substance which will readily move by gravity—such as sand or shot—though liquid is preferred on account of its celerity of action. The pivot is located between the two ends of the tube, and at a point which slightly throws said tube out of balance. Inside of the tube is a dam, *e*, extending from one side part way across the tube, said dam serving to retard, to a certain degree, the flow of the fluid from end to end of the tube. The tube is carried by a hanger, H, attached to a rod, *c*, which is pivoted on the yoke A, as best seen in Fig. II of the drawings, said hanger consisting of a band clasped adjustably around the tube and allowing the latter to be turned on its axis. In so turning the tube the dam thereof is tilted correspondingly, and consequently the speed of the flow of the fluid from end to end of the tube is thus regulated.

Fig. IV of the drawings illustrates the aforesaid adjustment of the tube C, the full and dotted lines across the interior of the tube indicating the different portions of the dam *e*. To the armature is attached an arm, *f*, which rests with its free end on the lighter end of

the tube C, the gravity of said arm serving to counterpoise said tube and depress the aforesaid end thereof when the armature is dormant. A wire, *a*, is extended from the electro-magnet to the stationary electrode E on the gas-burner.

In operating my invention the yoke A is swung into position to be in communication with the battery by the medium of the contact-point *b* and wire extending therefrom to the battery, as represented by full lines in Figs. I, II, and III of the drawings. The ground-connection being normally broken at the burner, leaves the armature dormant, and causes the arm thereof to depress the lighter end of the tube C. When turning the gas-cock to turn on the gas, the electrodes E F are brought in contact with each other, thereby making a ground-connection for the electric current, as represented by arrows in the drawings. In making the connection a spark is produced between the electrodes E F, which spark ignites the gas issuing from the tip of the burner. Simultaneously with this operation the electric current is caused to pass through the electro-magnets, and if the electric current is continued by reason of the electrodes E and F having become caught on each other, or the wire *a* having become otherwise grounded, then the electro-magnets become sufficiently excited to attract the armature, thereby lifting the arm *f* and allowing the tube C to tilt by gravity, as illustrated by dotted lines in Fig. III of the drawings. In so tilting the tube the fluid flows gradually toward the lower end of the tube, and finally adds thereto a preponderance of weight, which produces sufficient pressure on the arm *f* to tilt the yoke A out of communication with the contact-point *b*, as represented by dotted lines in Fig. I of the drawings. The circuit is thus broken, and remains so until the yoke A and tube C are swung by hand back to their original positions, where they will remain dormant, providing the wire running to the burner is out of communication with the ground. In tilting the tube C, as aforesaid, the dam *e* thereof retards the flow of the fluid sufficiently to maintain the circuit closed long enough to insure the lighting of the gas of the burner. So long as the electrodes E F are in proper condition to release each other immediately after their contact, and the wire *a* is properly arranged out of contact with other objects making ground-connections, the turning of the gas-cock in turning on the gas will not affect the magnets sufficiently to actuate the armature; hence the described automatic circuit-breaker will remain at rest under the ordinary working of the gas-lighting apparatus. It is only at times when the wire *a* becomes accidentally grounded, and is so retained. Then the aforesaid automatic circuit-breaker is brought into action; hence it requires no especial attention, except when actually necessary, to remedy the hereinbefore-described defects of the retention of the ground-connection of the wire *a*, which defect causes undue waste of the battery.

I do not limit my invention to the within-described specific arrangement of the devices in relation to each other, nor to the use of said devices for merely breaking the circuit, as it is obvious that the same may also be employed for closing the circuit by simply changing the relative position of the parts.

One of the main objects of this invention is to retard to a certain degree the action of the circuit-breaker, for the reason hereinbefore stated, and this is effected by the tubular lever and its dam checking the flow of the liquid in said lever.

Having described my invention, what I claim as new, and desire to secure by Letters Patent, is—

1. In combination with the electric circuit-breaker, an electro-magnet and pivoted armature, a pivoted lever actuated by said armature and arranged to transmit motion to the circuit-breaker, and a weight arranged to be movable on said lever from end to end thereof, and thereby impart to said lever the power for actuating the circuit-breaker, substantially as set forth.

2. In combination with the circuit-breaker and electro-magnets, the pivoted tube C, fluid in said tube, a partial dam in the central portion of said tube, and a pivoted armature to counterpoise the fluid of the tube, substantially as set forth.

3. In combination with the contact-points of the broken circuit, the metallic yoke A, pivoted to turn in a vertical plane and encounter said contact-points, the magnet M, rigidly secured to said yoke, the pivoted armature B, the tube C, pivoted between its two ends, and fluid in said tube, and an arm carried by the armature and bearing with its free end on the lighter end of the tube to counterpoise the same when the armature is dormant, said counterpoise being removed from the tube automatically with the attraction of the armature to the magnet, substantially as and for the purposes set forth.

4. In combination with the pivoted circuit-breaker and electro-magnets connected thereto, the pivoted hanger H, the tube C, connected with said hanger and mounted therein so as to rotate about its axis, fluid in the tube, and a dam extending part way across the interior of the tube, whereby the flow of the fluid can be regulated by turning said tube on its axis, substantially as described and shown.

In testimony whereof I have hereunto signed my name and affixed my seal, in the presence of two attesting witnesses, at Syracuse, in the county of Onondaga, in the State of New York, this 22d day of June, 1885.

M. JERVIS MYERS. [L. S.]

Witnesses:
FREDERICK H. GIBBS,
E. C. CANNON.