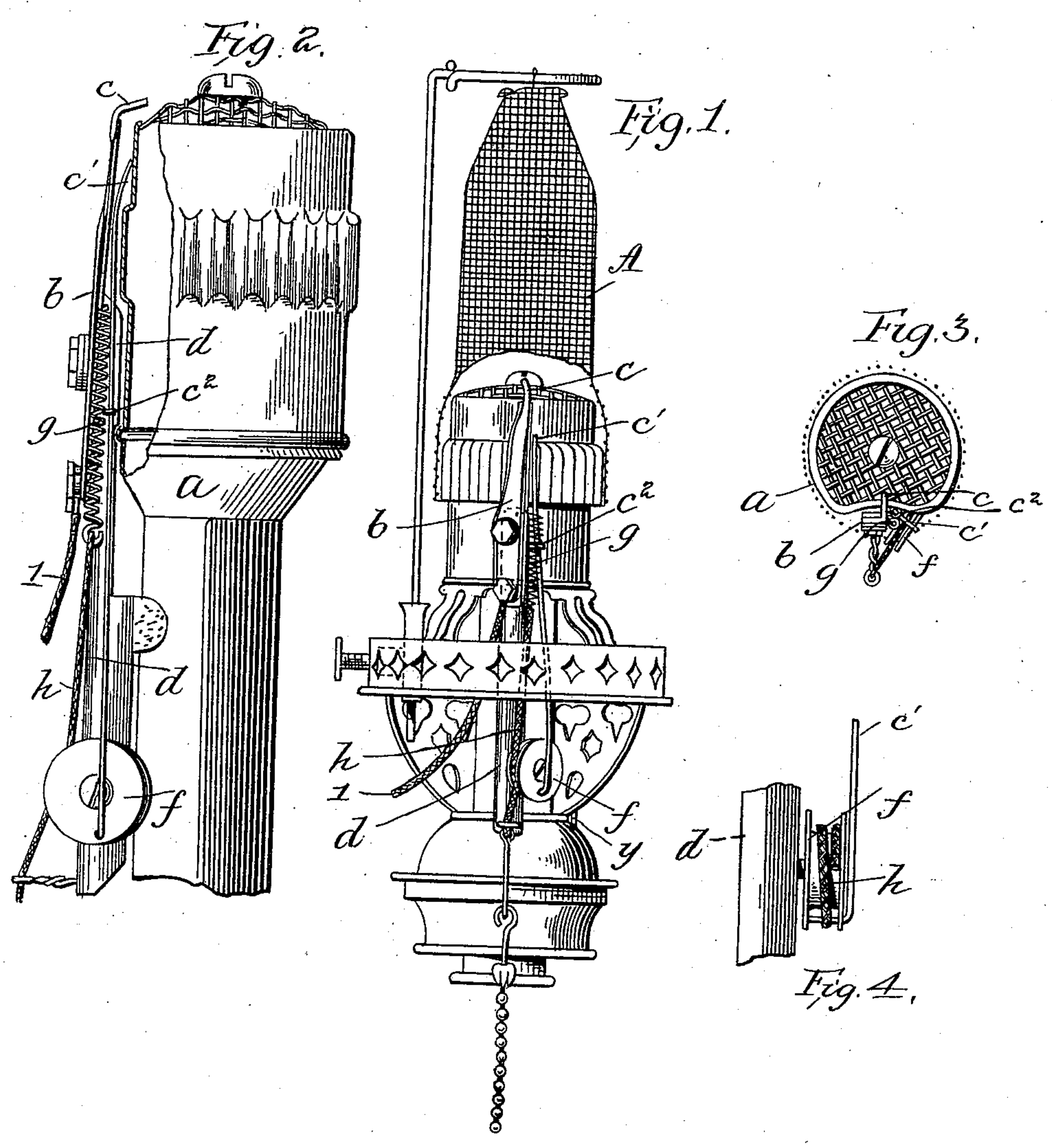


(No Model.)
R. A. SCHOENBERG, J. W. FLUCKER & A. N. KEEDWELL.
ELECTRICAL LIGHTING APPARATUS.

No. 557,434.

Patented Mar. 31, 1896.



Attest
[Signature]
F. L. Middleton

Inventors:
 Ralph A. Schoenberg
 John W. Flucker
 Alfred N. Keedwell
 by *[Signature]*
 Att'y.

UNITED STATES PATENT OFFICE.

RALPH A. SCHOENBERG, JOHN WILLIAM FLUCKER, AND ALFRED N. KEEDWELL, OF NEW YORK, N. Y.

ELECTRICAL LIGHTING APPARATUS.

SPECIFICATION forming part of Letters Patent No. 557,434, dated March 31, 1896.

Application filed December 5, 1895. Serial No. 571,167. (No model.)

To all whom it may concern:

Be it known that we, RALPH A. SCHOENBERG, JOHN WILLIAM FLUCKER, and ALFRED N. KEEDWELL, citizens of the United States, residing at New York, in the county of New York and State of New York, have invented certain new and useful Improvements in Electrical Lighting Apparatus, of which the following is a specification, reference being had therein to the accompanying drawings.

Our invention relates to electrical gas-lighting attachments of that class in which ignition is produced by a spark caused by making and breaking a circuit.

It is designed especially for burners of the Welsbach type and is especially adapted to such burners, but is not necessarily confined thereto.

The object of this invention is to get the lighting device into limited space and to adapt it to this class of burners.

Our invention is shown in the accompanying drawings, in which—

Figure 1 represents, for illustration, a Welsbach lamp with our lighting attachment thereon, the whole being shown in side elevation. Fig. 2 shows a part of the same broken to show a side view of the attachment. Fig. 3 represents a top view of Fig. 2. Fig. 4 is a view of a detail.

In the drawings is represented a gas-burner of the Bunsen type having an incandescent mantle A, supported, as usual, with the Welsbach burners. Upon the side of the shell a of the cap or mixing-chamber is placed an insulated conducting-bar b, the upper extension c of which forms the fixed electrode of the attachment. It is turned over toward the interior of the mantle (in the form shown) a little above the perforated top of the cap and stands off from the shell of the cap far enough to leave space for the movable electrode. For convenience of construction this bar b is insulated upon a main bar d, which serves as a foundation to the whole attachment and which when applied to the burner is fixed to the center tube D.

On one side of the bar d is an eye c², in which the movable electrode c' is guided. The electrode c' is an elastic conducting-wire and is connected at its lower end with a mov-

able piece, which imparts to the wire a longitudinal and lateral motion, causing the upper end of said wire first to move longitudinally on the inwardly-turned end of the fixed electrode and afterward to move back and laterally a little outside of a plane tangential to the cap and so as to snap off from the fixed end by very slight movement. A convenient form of this movable piece is shown. It consists of a grooved wheel or pulley f, pivoted on the main bar d, and on the outside of said pulley is pivoted, eccentrically, the lower end of the movable electrode. The pulley is shown as a very convenient form for the reason that by the eccentric attachment of the wire the proper movements may be imparted thereto, and the chain attachment by means of which the apparatus is moved, as well as the returning-spring connection, may be wound upon the grooved periphery of said pulley. The spring which returns the pulley and electrode to normal position is shown at g. Its upper end is attached to bar d, and the lower end is connected to the chain h wound in the groove of the pulley.

The pulley-wheel is pivoted on the lower end of the main bar in a special manner. It is required that the free end of the movable electrode move in limited space and keep out of contact with the fixed bar when in normal position, so as to avoid short-circuiting. The movement must be both longitudinal and lateral. This double movement is effected by its connection with the pulley set obliquely to the plane of lateral movement of the movable electrode. This obliquity causes the pulley in turning to carry the lower end of the movable electrode upward and laterally and at the same time outward, so that the free end by reason of the central pivoting in the eye is pressed inwardly and away from the fixed electrode, thus preventing danger of short-circuiting. The lower end of the movable electrode is so pivoted that when the parts are in normal position its pivot is at the dead-point or directly below the pivot of the pulley. The pulling-chain h is wound around the pulley and thence carried up and connected to the spring. The lower end of the movable electrode is bent and connected to the pulley by insertion through the hole made

through from side to side, and the bent end also passes through a link of the chain, (see Fig. 4,) so that when the electrode-wire is secured it secures also the chain.

5 The apparatus being in normal condition, the first effect of the pulling is to rotate the pulley and to raise the movable electrode, and it is so adjusted in relation to the inwardly-turned end of the fixed electrode that
10 its upper end when raised passes on one side of the said turned end, as shown in Fig. 1 on the left side, and rises in rubbing contact therewith until the pivoted end of the electrode passes the dead-point on the pulley-
15 face, when the said end is moved down and to the left. The pulley in this movement makes a three-quarter turn. This causes the upper end of the electrode to be drawn back, still rubbing against the side of the turned
20 end of the other electrode, and finally to slip off under tension, which causes the abrupt break.

The retracting-spring immediately returns all the parts to normal position and the electrodes are kept apart and in proper position
25 for repeated action.

The wire from the battery is shown at *l*, and is connected to the conducting-bar by a screw, or in any suitable way, and the attachment is complete in itself and is adapted to
30 be placed on burners of forms now in use.

We have shown it as arranged to fit within the mantle, and this is the best arrangement, as the spark is thereby discharged in the current of gas; but it may also be placed outside
35 of the mantle, and in either case fits and works in such limited space and with so little jar that it does not disturb the mantle, however fragile.

40 When the electrodes are placed within the mantle, it may be desirable to indent the shell of the cap, as shown in Fig. 3, the attachment being placed in the indentation. The attachment may also be located beneath and be
45 arranged to light a supplemental flame, extinguished by movement of the attachment, after it has performed its office of lighting

the main flame. The arrangement of the parts is specially adapted, however, to the combination shown with a mantle. The rigid
50 electrode is interposed between the movable and the mantle and thus guards the mantle against injury from the movable electrode, and from the movement of the electrode and its mode of contact the rubbing tends to keep
55 the contact-surface clear and there is very little jarring of the mantle. We prefer to connect the gallery and the air-shutter or other parts which support the burner by a pin set in the upper part and entering a hole
60 below, or other suitable connection, as shown at *y*, Fig. 1, so that the burner may be removed, but, when in place, may not turn. This is to prevent unnecessary jar and to
65 keep the chain in place.

We claim—

1. In combination in a Welsbach light having a fragile mantle, the burner having an indent and below which the mantle depends, a fixed electrode extending up alongside the
70 burner, opposite the indent and within the mantle and having an inwardly-bent upper end, and a movable electrode interposed between the fixed electrode and the indent and means for operating the movable electrode,
75 substantially as described.

2. In combination in a Welsbach light, the mantle, the burner having the indent, the bar extending up along the burner and within the mantle and having the fixed electrode at
80 its top, the wheel pivoted to the lower part of the bar, the movable electrode connected therewith and extending up between the bar and indent of the burner and means for operating the wheel, substantially as described.
85

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

RALPH A. SCHOENBERG.
JOHN WILLIAM FLUCKER.
ALFRED N. KEEDWELL.

Witnesses:

MAX JUST,
F. A. ALBERT.