(No Model.) 2 Sheets—Sheet 1.

N. L. ROOT, C. L. REED & D. C. HALE.

ELECTROLIER.

No. 565,092. Patented Aug. 4, 1896.

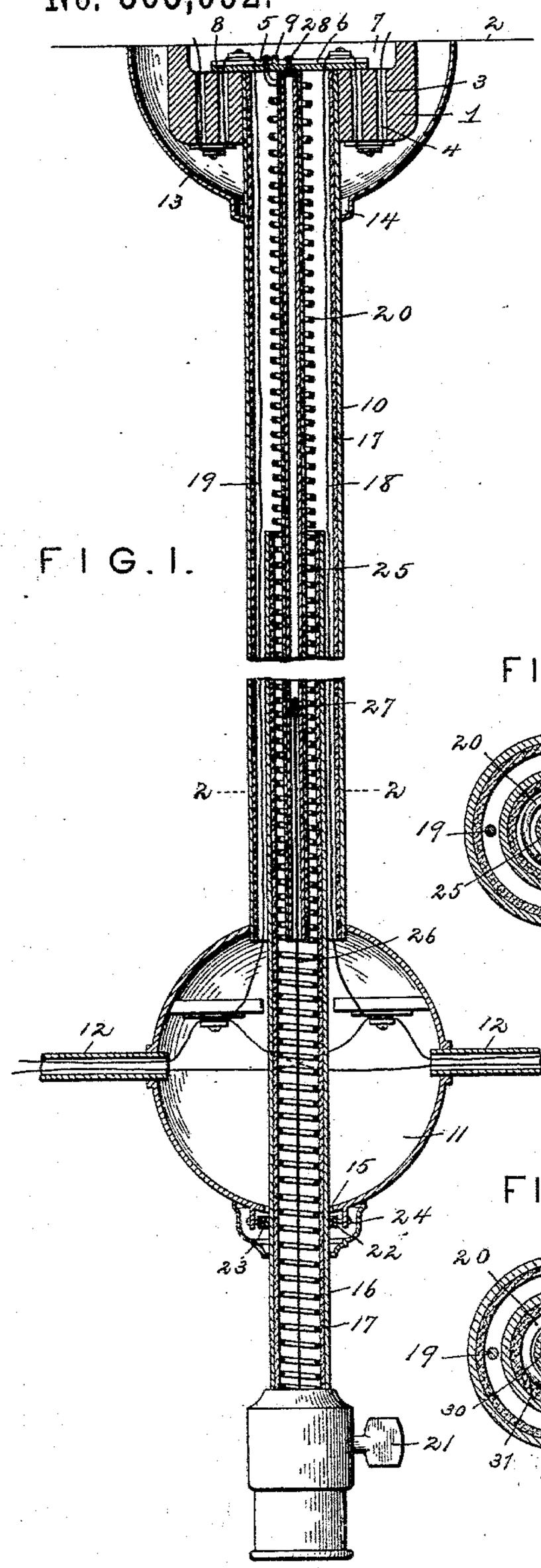

FIG. 1.

FIG. 3.

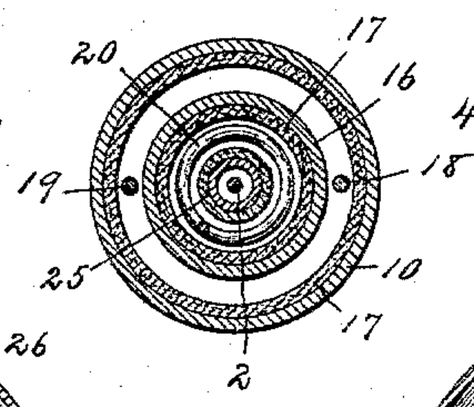

FIG. 2.

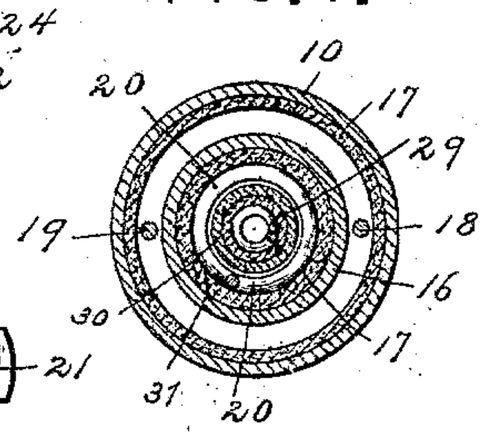

FIG. 4.

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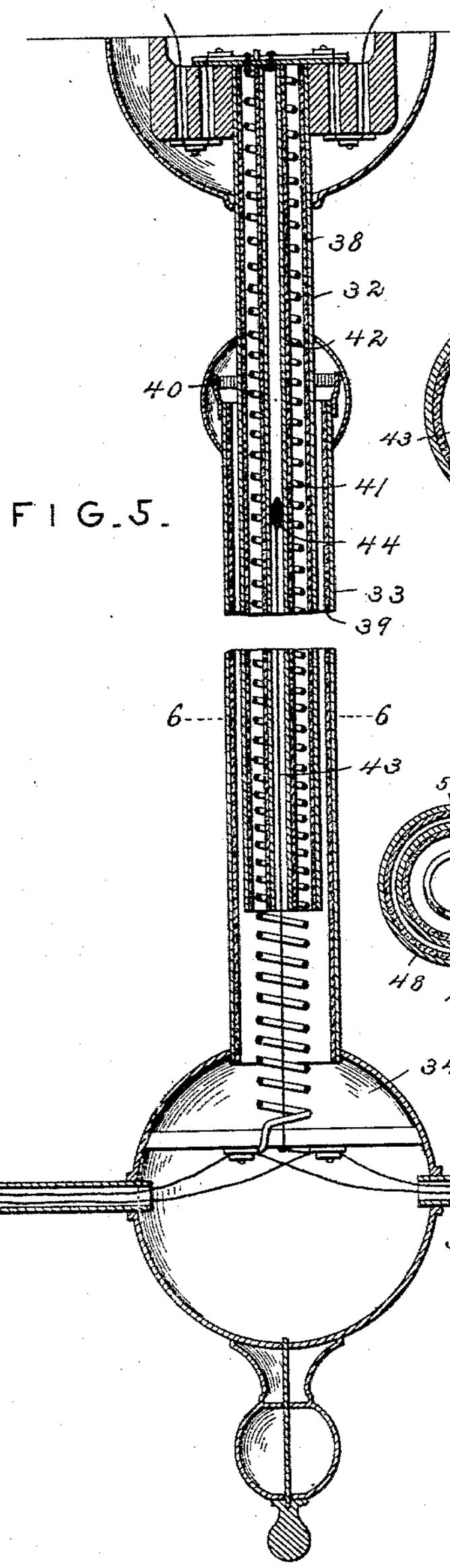


FIG. 5.

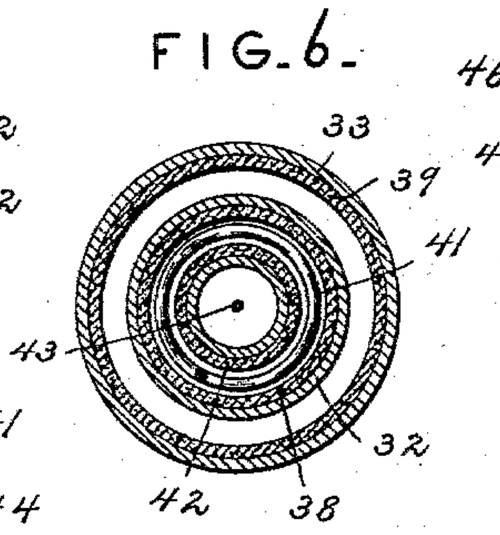


FIG. 6.

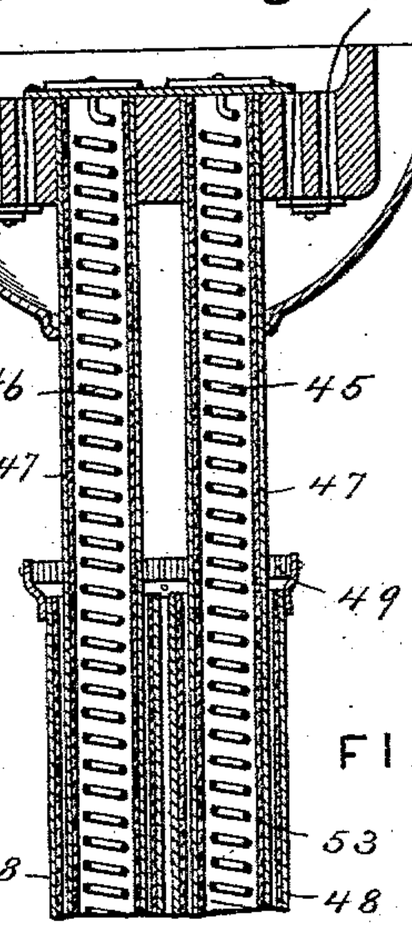
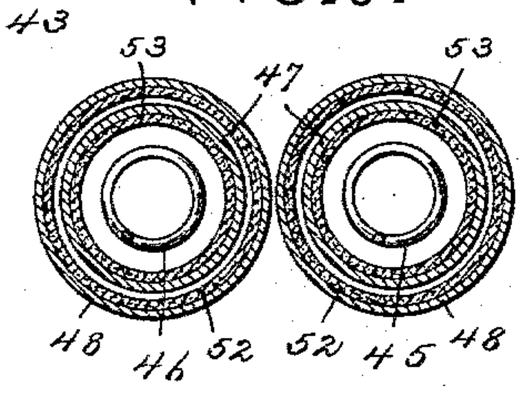
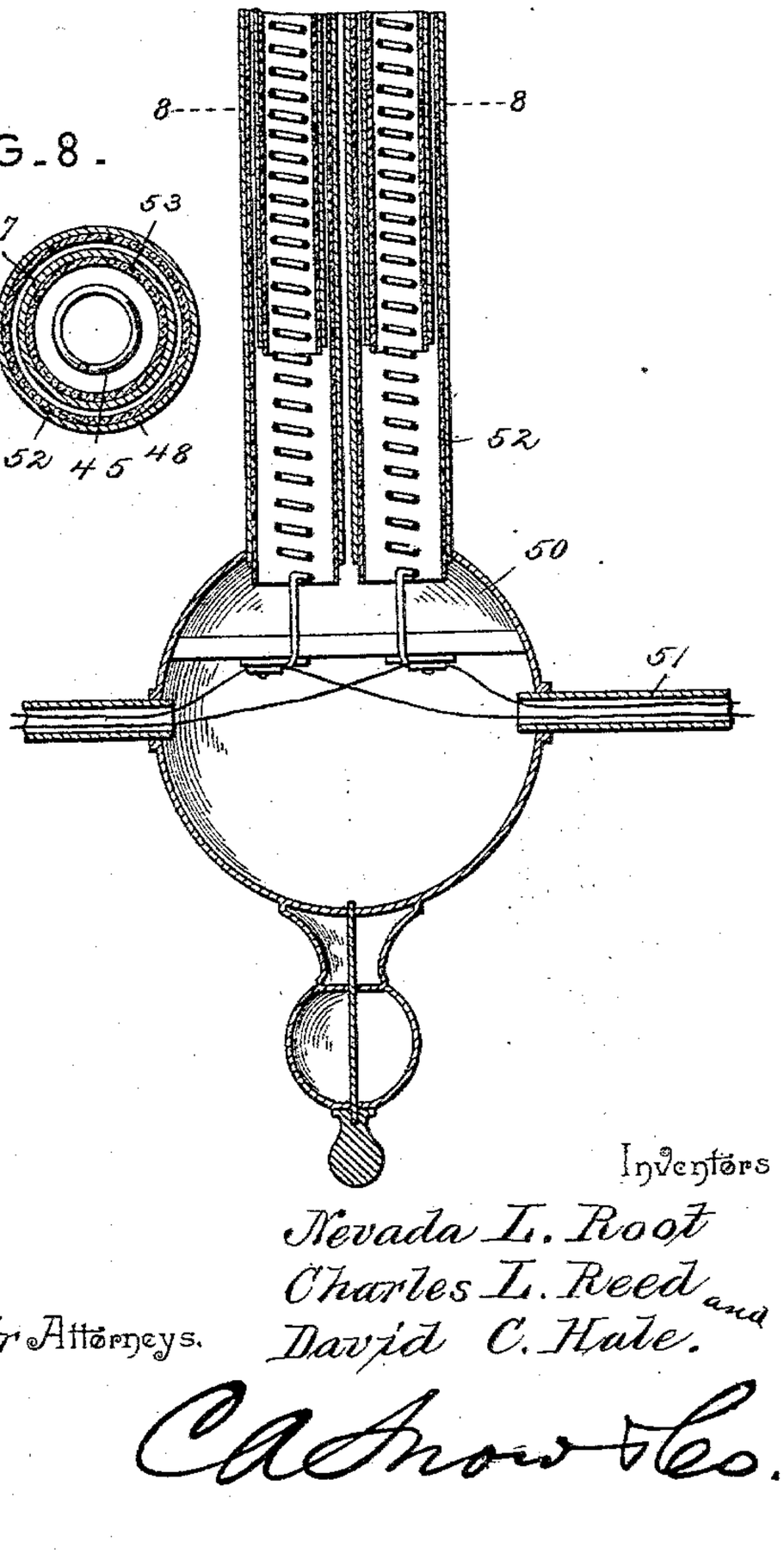


FIG. 7.

FIG. 8.





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UNITED STATES PATENT OFFICE.

NEVADA L. ROOT, CHARLES L. REED, AND DAVID C. HALE, OF LONGMONT, COLORADO.

ELECTROLIER.

SPECIFICATION forming part of Letters Patent No. 565,092, dated August 4, 1896.

Application filed March 13, 1895. Serial No. 541,598. (No model.)

To all whom it may concern:

Be it known that we, NEVADA L. ROOT, CHARLES L. REED, and DAVID C. HALE, citizens of the United States, residing at Longmont, in the county of Boulder and State of Colorado, have invented a new and useful Electrolier, of which the following is a specification.

Our invention relates to an improvement in adjustable electroliers, and the objects in view are to provide improved extensible conductors for conveying the electrical current, and, furthermore, to provide a simple and compact construction having its members suitably insulated to prevent grounding, leakage, &c.

Further objects and advantages of the invention will appear in the following description, and the novel features thereof will be particularly pointed out in the appended claims.

In the drawings, Figure 1 is a vertical sectional view of an electrolier constructed in accordance with our invention. Fig. 2 is an enlarged transverse section on the line 2 2 of Fig. 1. Fig. 3 is a vertical section of a slightly-modified form of the device. Fig. 4 is an enlarged transverse section on the line 4 4 of Fig. 3. Fig. 5 is a vertical section of another modified form of the invention, in which all of the ordinary supporting-tubes are connected to the movable member. Fig. 6 is an enlarged transverse section of the same on the line 6 6 of Fig. 5. Fig. 7 is a vertical section of another modified form of the invention, in which the extensible conductors are housed in independent tubular members. Fig. 8 is an enlarged transverse section of the same on the line 8 8 of Fig. 7.

Similar numerals of reference indicate corresponding parts in all the figures of the drawings.

1 designates an insulating-block which is adapted to be fastened to the ceiling, the line of which is indicated at 2, said block being provided with vertical perforations 3, through which the wires or conductors 4 extend, said wires or conductors extending down through the outer perforations, thence upward through the inner perforations, and connecting, respectively, with the contact-plates 5 and 6, which are arranged in a cavity 7 in the upper side of the insulating-block. Said contact-plates are separated from the block by an insulating-disk 8, having an intermediate projection 9, which is interposed between the contiguous edges of the contact-plates, and thereby prevents communication of the electrical current from one plate to the other.

Fitted at its upper end in a central opening of the insulating-block is a tubular stationary member 10, which forms the stem of the electrolier, and in the construction illustrated terminates at its lower end in a hollow globe 11, with which communicate the lateral tubular arms 12, adapted to carry side lights. (Not shown.) The insulating-block is covered and concealed by a hollow shield 13 of approximately semispherical construction, with an opening 14, through which the member 10 projects.

Fitted to slide in a guide-opening 15 at the lower side of the spherical enlargement 11 of the stationary member or stem is a tubular extension arm or movable member 16, which projects upward into the stationary member or stem 10, and is adapted to be moved vertically therein to arrange the lower or exterior portion of said arm 16 at the desired elevation. The stationary member 10 and the adjustable member 16 are insulated by material 17, which is applied to the inner surfaces of said parts, and between said members extend the conductors 18 and 19, which are attached at their upper ends, respectively, to the contact-plates 5 and 6, and at their lower ends extend into the tubular arms 12, which are carried by the stationary member.

Arranged concentrically in the stem and extending through the tubular arm 16 is an actuating-spring 20, which is electrically connected at its upper terminal to the contact-plate 5, and is attached at its lower end, mechanically, to the lower termixal of the arm 16, and electrically to a switch of the ordinary construction, (not shown,) such switch being controlled by the thumb-plug 21. In addition to forming one of the electrical conductors for the lamp suspended by the adjustable member of the device, this spring serves to return said adjustable member to its folded or raised position when released, and, in order

to hold said member in its extended position, we employ a friction-band or collar 22, provided upon its inner surface with frictional packing 23 to bear against the surface of the member 16, said band or collar being adjustable by means of set-screws 24.

The other electrical conductor for the lamp carried by the adjustable member of the electrolier is also extensible, but in the construction illustrated in Fig. 1 consists of an exteriorly-insulated tubular member 25, arranged concentric with and extending through the spring, and a rod or wire 26, attached at its lower end to the lower end of the adjustable arm and provided at its upper end, which fits in the bore of the tubular member, with a knob or enlargement 27, which is in electrical contact with the inner surface of said tubular member. The wire or rod is insulated throughout, with the exception of the contact-knob or enlargement 27, and the tubular member is electrically connected with the contact-plate 6 by means of a pin or rivet 28.

From the above description it will be seen that the adjustable arm is capable of movement to occupy any desired position without affecting the electrical connections, and that the spring for actuating said adjustable member is utilized as one of the conductors.

In the construction illustrated in Figs. 3 and 4 an inner coiled spring 29 is substituted for the inner extensible conductor 25 26 of the form shown in Fig. 1, said spring 29 being electrically connected at its upper end to the contact-plate 6 and at its lower end to the lower end of the adjustable arm. In this case the inner spring assists the outer spring, also used in this form of the device, in raising the adjustable arm to its normal position when released.

An insulating-tube of telescoping sections 30 and 31 is arranged within the outer spring 20 and the inner spring 29 to prevent short-circuiting, this form of insulation being preferable to independent insulation of the conductors for the reason hereinafter explained.

In Figs. 5 and 6 we have shown another modified form of the device in which the stationary member or stem 32 is of smaller diameter than the movable member or arm 33, whereby the latter is fitted to slide exteriorly upon the former, the globe 34, which is supported by the movable member, carrying the lateral tubular arms 35, through which the conductors 36 and 37 extend to the side lights. (Not shown.) In this form of the invention the stem and adjustable arm are provided with interior insulating-linings 38 and 39, similar to those described in connection with the other forms of the electrolier, and the clamp 40, by which the adjustable arm is held at the desired extension, is carried by the upper end of said arm and is in frictional contact with the exterior surface of the stem or stationary member. The helical spring 41, which forms one extensible conductor, and which also serves as the means for returning the adjustable member to its folded or retracted position, is bare or uninsulated, and is coiled around an inner extensible conductor comprising an exteriorly-insulated tubular member 42 and a wire 43, extending into said tubular member and provided with a contact-head or enlargement 44. It will be seen that this form of the invention is similar, in general features, with the form shown in Fig. 1, the differences being those rendered necessary by providing adjustment for all of the lights, whereas in Fig. 1 the main lights are stationary and only a single lamp-socket is carried by the adjustable arm. Obviously, a group of lamp-sockets may be attached to the adjustable arm where more than one light is desired, but the construction shown will be sufficient to illustrate the features of our invention.

In Figs. 7 and 8 is shown a form of the invention in which, as in Figs. 3 and 4, both of the extensible conductors consist of helical springs 45 and 46, each of which is arranged in a casing consisting of a stationary member or stem 47 and an adjustable member or arm 48 of larger diameter than the stem and fitted exteriorly thereon. These casings, consisting of telescoping members, are arranged side by side and parallel with each other, and a friction-collar 49 is employed to hold the adjustable member at the desired extension. In this, as in the form shown in Figs. 5 and 6, the globe 50, with the side arms 51 for the lights, are carried by the adjustable member, and insulating-linings 52 and 53 are arranged, respectively, in the adjustable and stationary members to prevent contact of the extensible conductors with conducting material and short-circuiting the current.

From the above description it will be seen that the construction is simplified by utilizing the actuating spring or springs for the adjustable member as a conductor or conductors for the electrical current. When the weight of the adjustable member of the electrolier may be supported by a single spring, an additional conductor of the construction shown in Figs. 1 and 5 may be employed, the same consisting of an exteriorly-insulated tube and a wire having electrical contact with the interior surface thereof; but when the weight of the movable member is sufficient to require two springs it is obvious that conductors other than those supplied by such springs may be avoided, as in the forms shown in Figs. 3 and 7. The strength of these springs being estimated to return the movable member to its normal or retracted position is sufficient to hold the coils in alinement and prevent such frictional contact with the contiguous portions of the device as to interfere with the proper operation of the apparatus. Furthermore, we have found that it is desirable, if not necessary, to employ independent insulation for the helical conductors, instead of insulating the wire by wrapping, or otherwise. The reasons for said preference is that if the

insulation is placed upon the wire itself soft insulating material must be used in order not to interfere with the action of the spring; and as soft insulating material is not primarily as effective, and is liable in the course of a short time to become rubbed and removed in places, the device would thereby be rendered inoperative by allowing the short-circuiting of the current. Furthermore, the coiling of a wire provided with soft insulating-covering, such as would be necessary to allow the proper operation of the spring when completed, would have the effect of abrading and injuring the insulation, and thus detracting from the efficiency of the insulation before application to the device. It is necessary, therefore, in order to secure satisfactory results, to employ a bare wire conductor, and provide auxiliary or independent means for preventing short-circuiting, and in the construction illustrated in the drawings this auxiliary or independent insulation is secured by means of insulating-linings in the tubes comprising the casing of the electrolier; and where, as in the form shown in Fig. 3, inner and outer helical conductors are employed, an insulating-tube comprising telecsoping members interposed between said conductors, the same inclosing the inner and being surrounded by the outer springs.

From the description it will be seen that the helical conductors are attached at their extremities respectively to the remote ends of the members of the casing, namely, the upper end of the stationary and the lower end of the movable member. This is necessary in order that the springs may serve as conductors and form the necessary electrical connection with the parts, but a further advantage of this arrangement resides in the fact that when the electrolier is adjusted to its greatest extension the spring is stretched only to double its length, and, therefore, not beyond its resilient strength. Hence, continued use of the spring does not deprive it of its elasticity and prevent its proper operation in returning the movable member to its normal or retracted position.

It is obvious that the spring cannot be stretched beyond double its normal length when the extremities thereof are connected respectively to the remote ends of the members of the casing.

Various changes in the form, proportion, and the minor details of construction may be resorted to without departing from the spirit or sacrificing any of the advantages of this invention.

Having described our invention, what we claim is—

1. In an electrolier, the combination with telescoping stationary and movable members, of a helical spring connecting said members to form an extensible electrical conductor and adapted to actuate the movable member to return it to its normal position, said helical spring being constructed of bare wire, and the insulation of the same being independent thereof, substantially as specified.

2. In an electrolier, the combination with telescoping, stationary and movable members, of a helical conductor arranged within and connected at its extremities respectively to the remote ends of said members, said conductor being constructed of bare wire, and insulating-linings arranged in said telescoping members, substantially as specified.

3. In an electrolier, the combination with telescoping, stationary and movable members, of a helical spring inclosed within said members and connected at its lower end to the adjustable member, said spring being constructed of bare wire and being adapted to serve as an electrical conductor, an exteriorly-insulated extensible conductor arranged within said spring, and insulating-linings arranged in the adjustable members, substantially as specified.

4. In an electrolier, the combination with telescoping, stationary and movable members, of independent concentric extensible electrical conductors inclosed by the telescoping members, one of said conductors being constructed of bare helically-coiled wire to form a spring whereby the movable member is actuated, the inner and outer insulation of said helically-coiled wire being independent thereof, substantially as specified.

5. In an electrolier, the combination with telescoping stationary and movable members, of a coiled electrical conductor attached at its upper end to a contact-plate and at its lower end to the movable member, and adapted to return said member when released to its normal position, and a second extensible conductor attached at its upper end to a contact-plate and at its lower end to the movable member and consisting of telescoping members, substantially as specified.

6. In an electrolier, the combination of a stationary insulating-block, insulated contact-plates electrically connected with feed-wires, a stationary stem, an adjustable arm telescoping within said stem, lamp-wires connected to the contact-plates and extending to the lower end of said stem for connection with stationary lamps supported by the stem, a coiled spring electrically connected at one end to one of said contact-plates and at the other end to the adjustable arm and adapted to serve as an electrical conductor for a lamp supported by the adjustable arm, and an extensible conductor arranged within said coiled spring and comprising a tubular member electrically connected at its upper end to the other contact-plate, and a wire or rod attached at its lower end to the adjustable arm, and provided with a knob or enlargement fitting in the bore of the tubular member, substantially as specified.

7. In an electrolier, the combination with a stationary stem provided at its lower end with a spherical enlargement having lateral arms, an adjustable arm arranged concen-

trically in the stem, said stem and arm being interiorly insulated, lamp-wires extending longitudinally through the stem and between the same and the adjustable arm to connect with lamps supported by the arms extending from the spherical enlargement, extensible conductors respectively connected at their upper ends to insulated contact-plates and connected at their lower ends to the adjustable arm, one of said concentric conductors consisting of a spring for returning the adjustable arm to its normal position when released, and means for holding the adjustable arm in its extended position, the same consisting of a clamping band or collar encircling the arm, a friction-cushion arranged within said band or collar, and set-screws for adjusting the band or collar, substantially as specified.

In testimony that we claim the foregoing as our own we have hereto affixed our signatures in the presence of two witnesses.

NEVADA L. ROOT.
CHARLES L. REED.
DAVID C. HALE.

Witnesses:
G. E. SMITH,
K. G. SUTPHEN.