

No. 697,708.

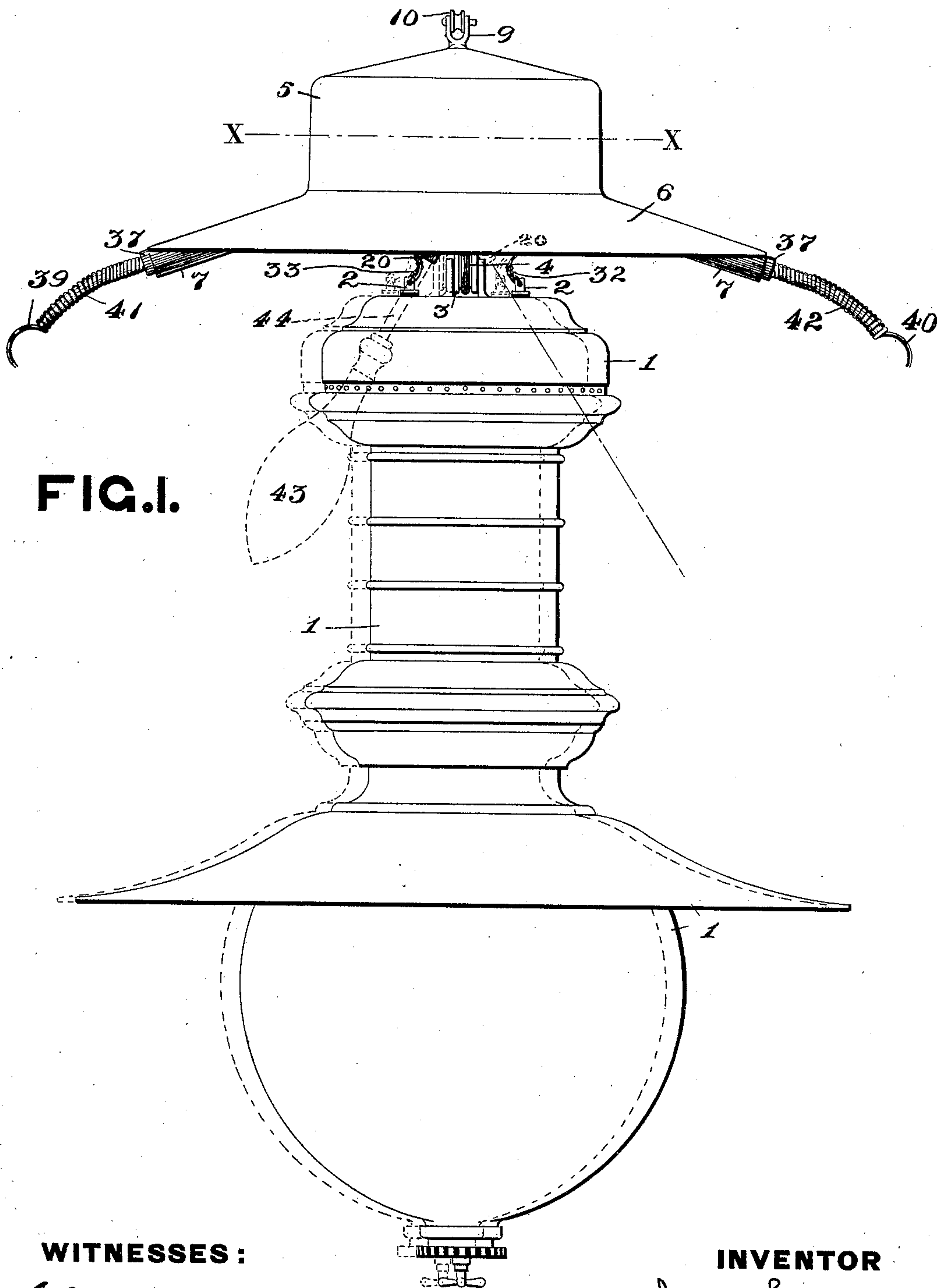
Patented Apr. 15, 1902.

H. ETHERIDGE.  
LAMP HOOD AND SWITCH.

(Application filed July 23, 1901.)

(No Model.)

4 Sheets—Sheet 1.



WITNESSES:

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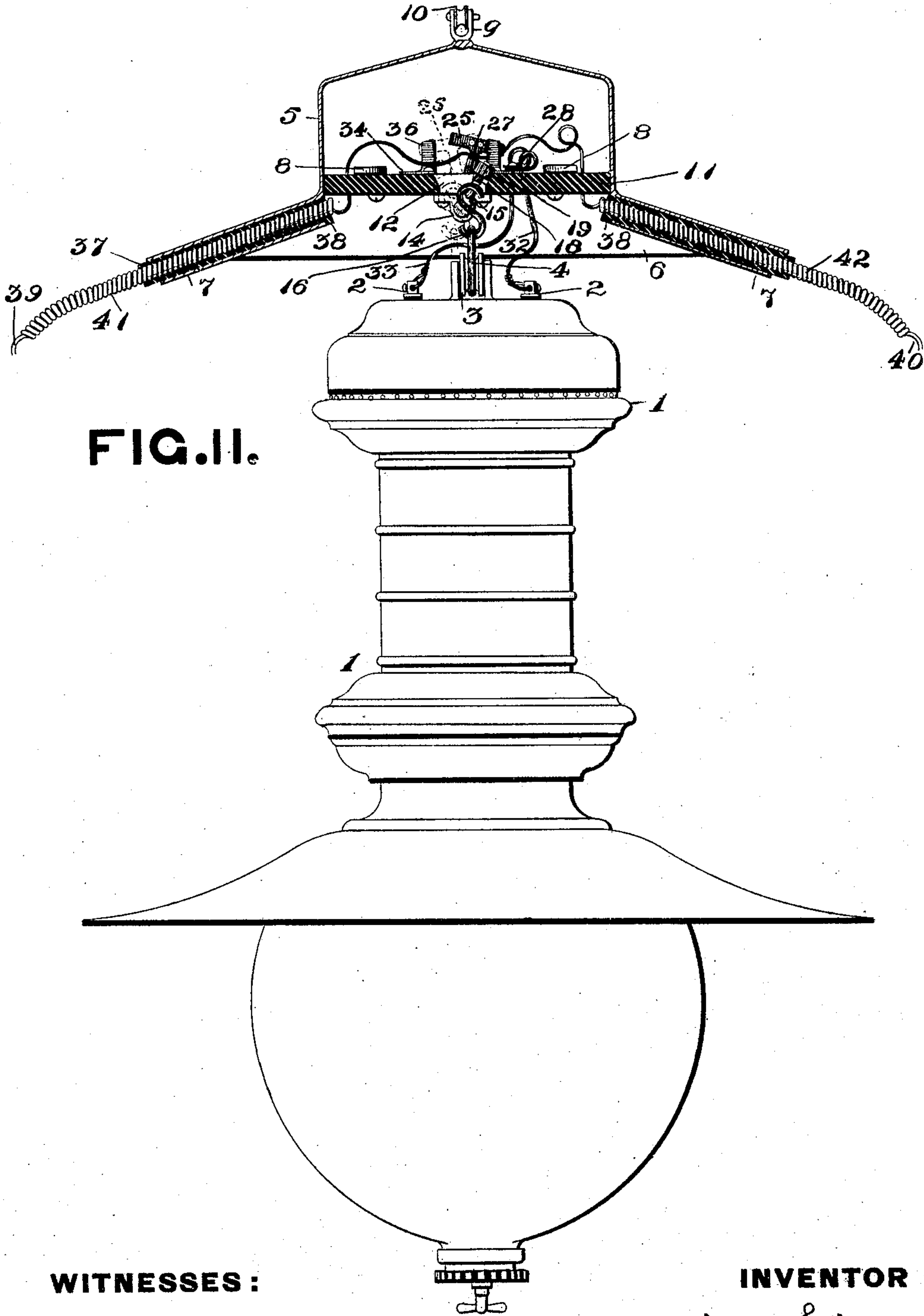


FIG. II.

WITNESSES:

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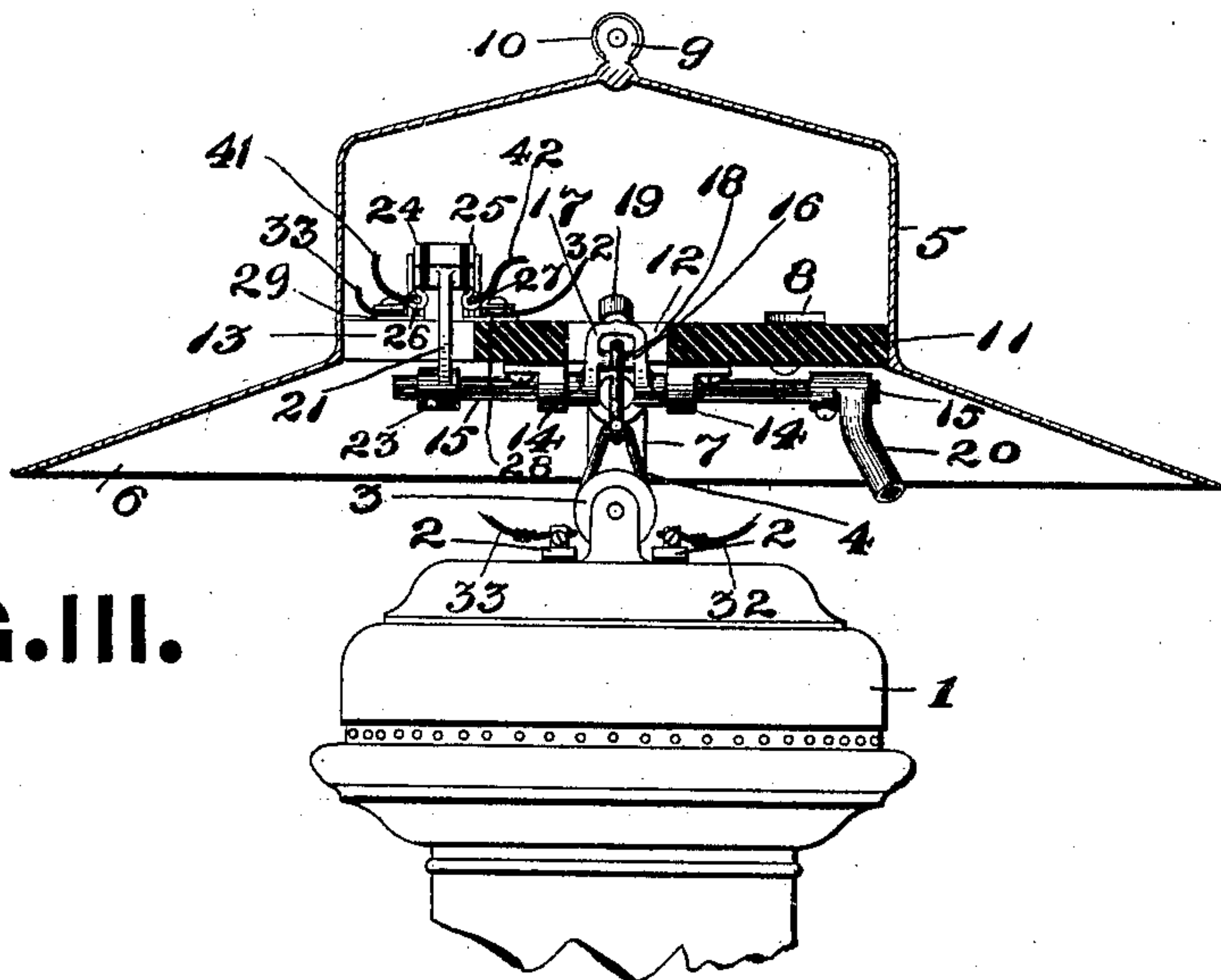
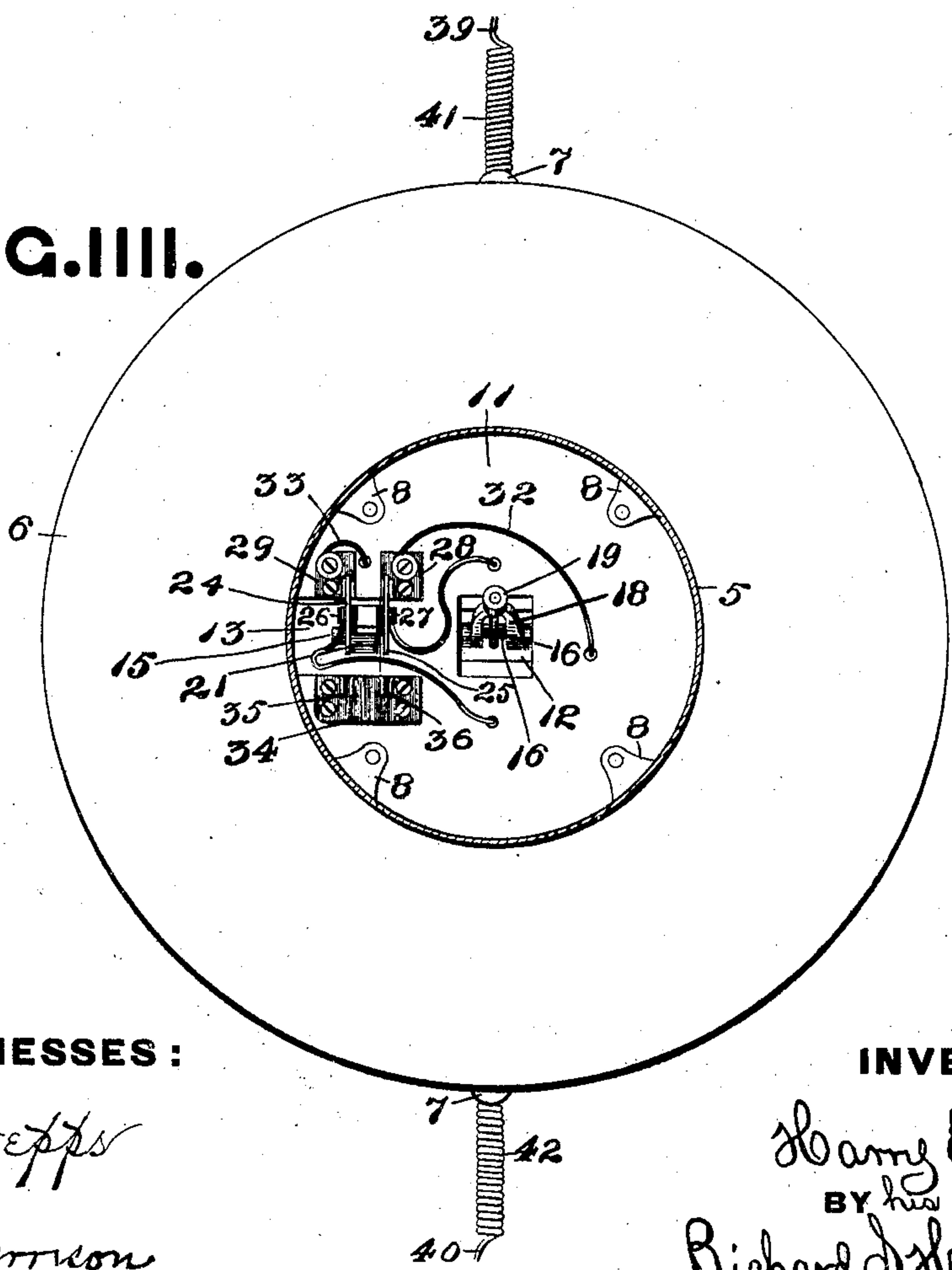


FIG. III.



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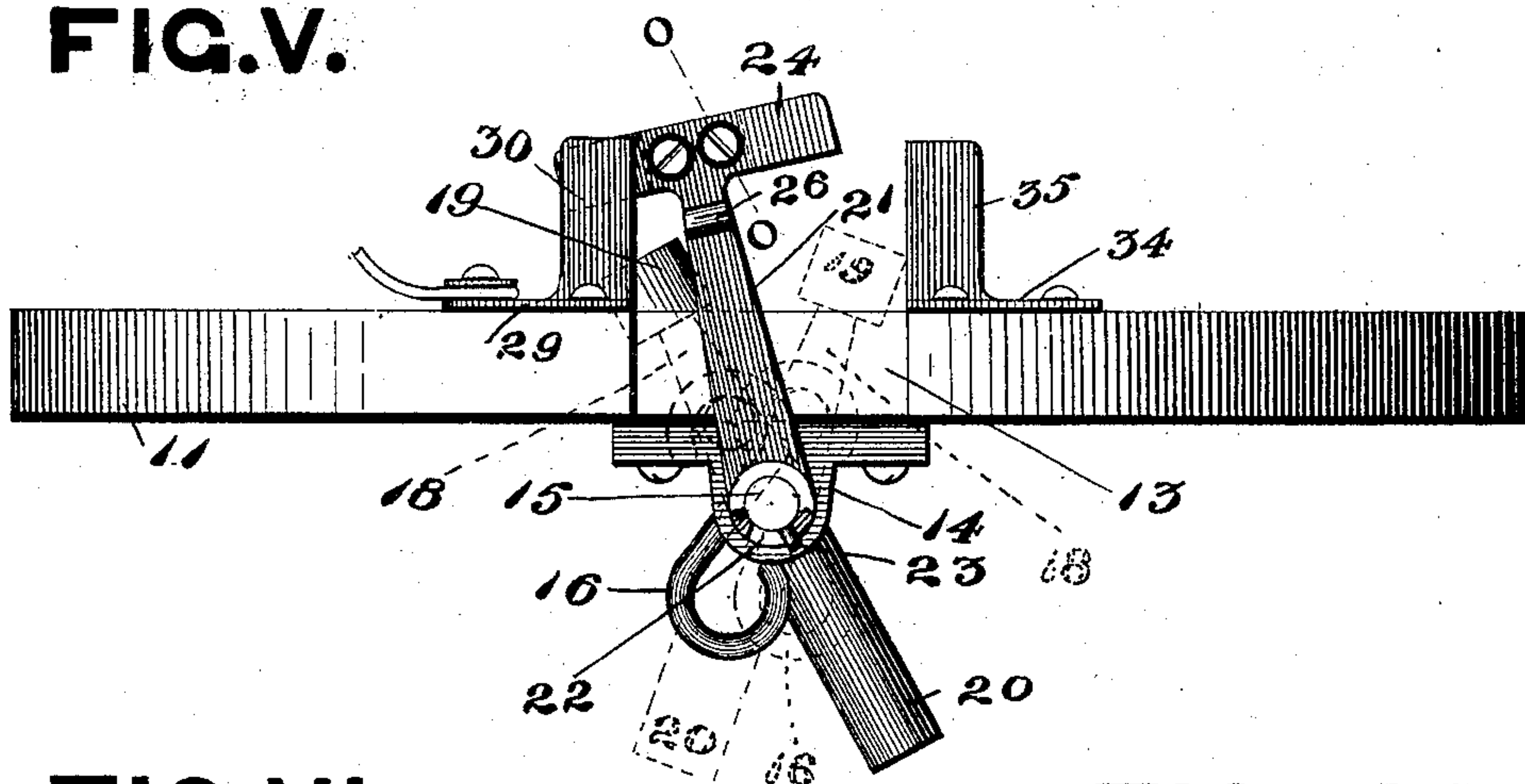
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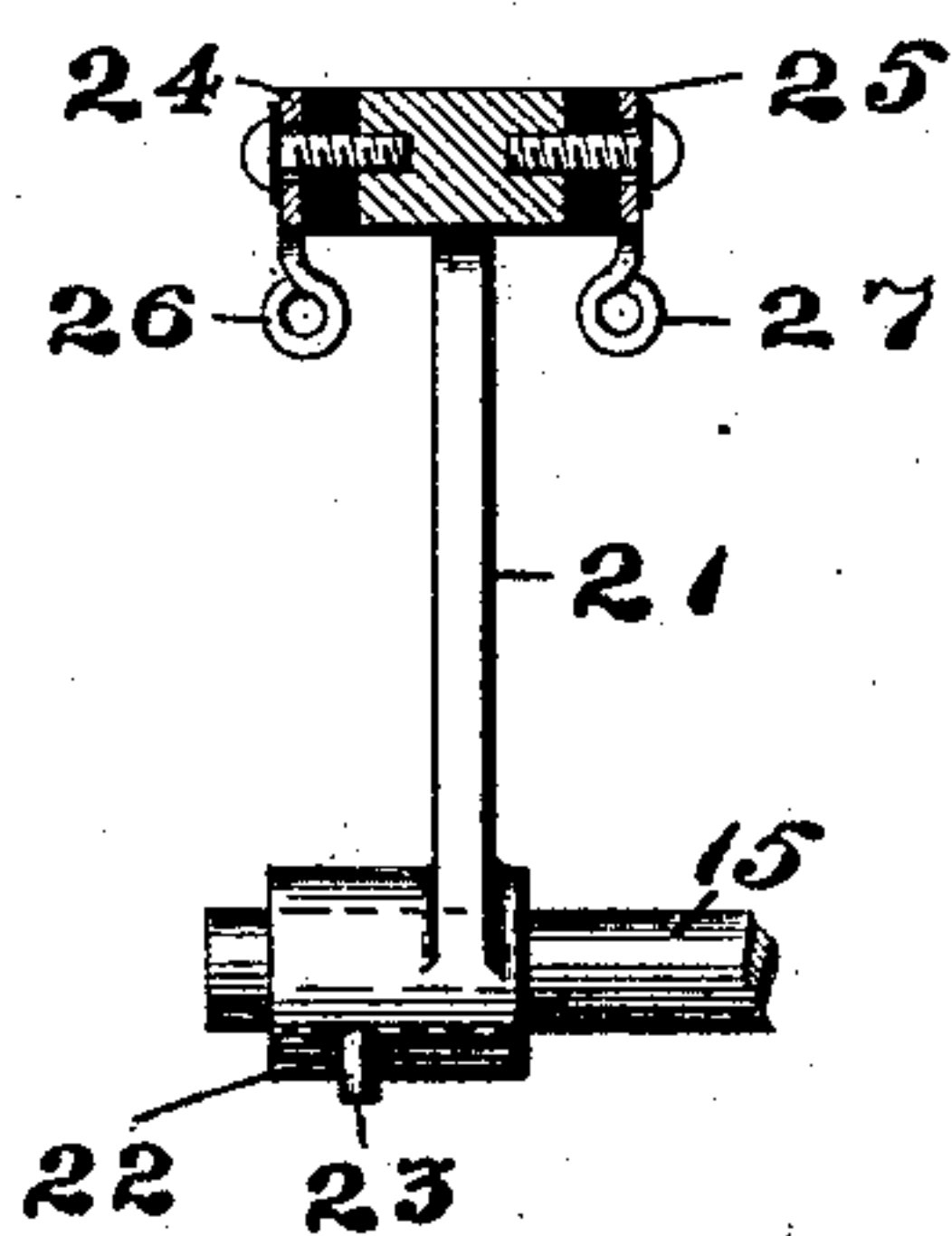
(No Model.)

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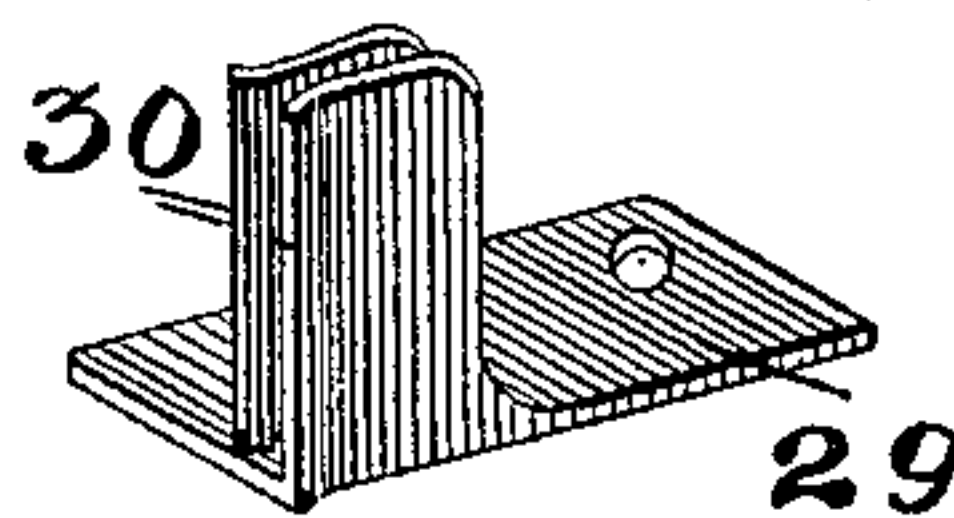
**FIG.V.**



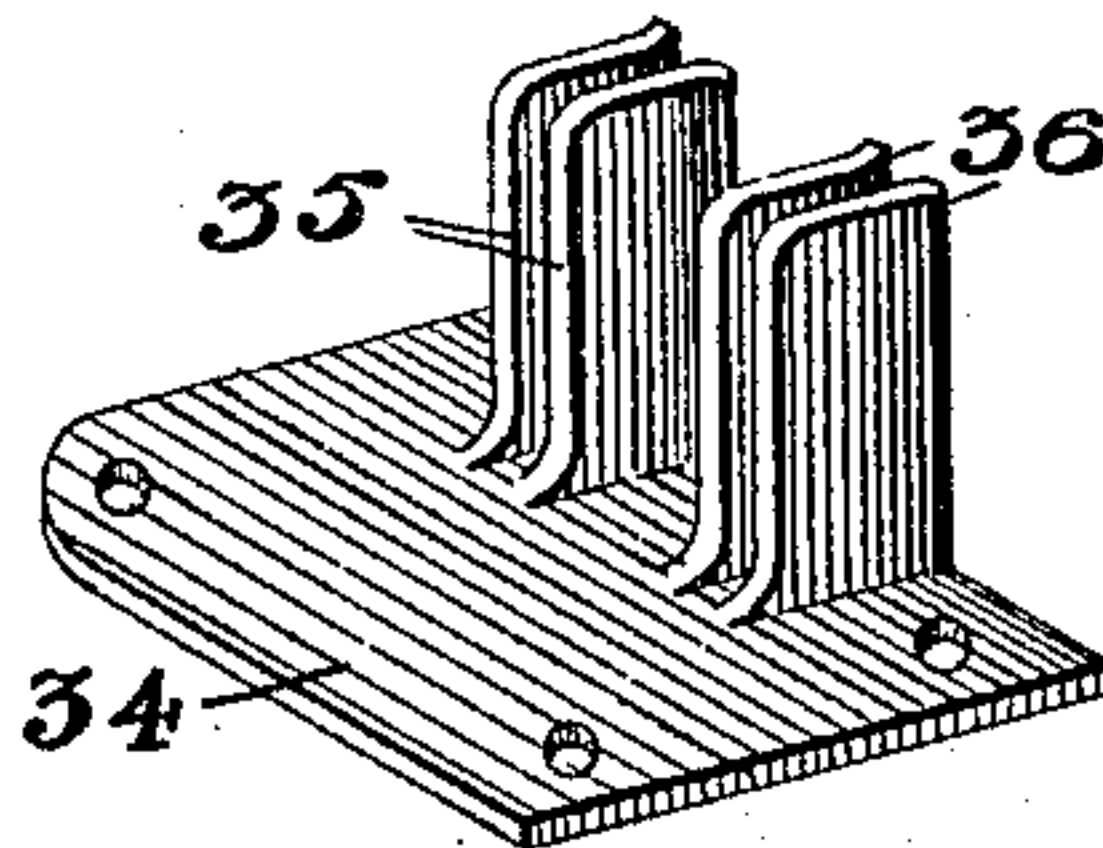
**FIG.VI.**



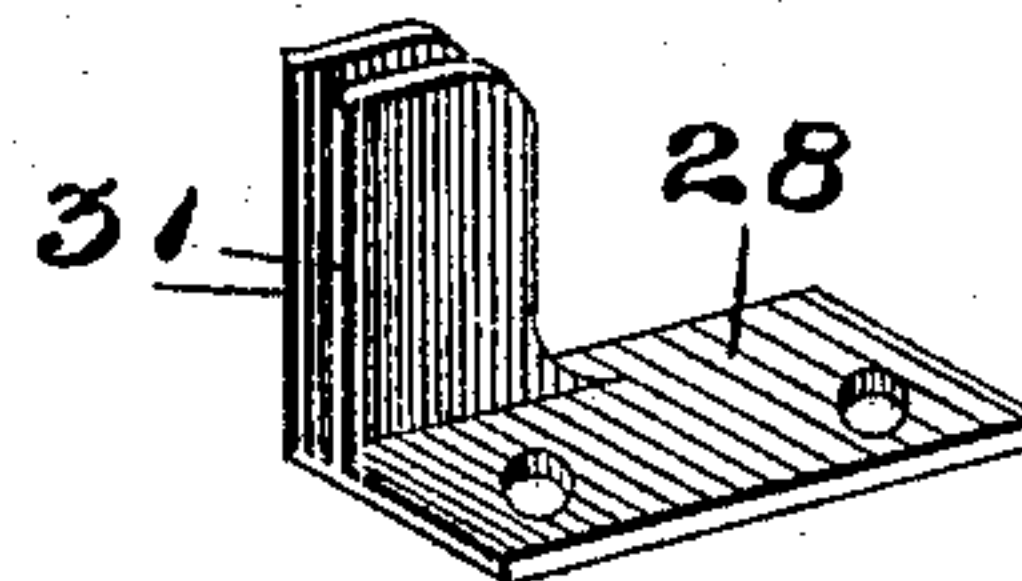
**FIG.VIII.**



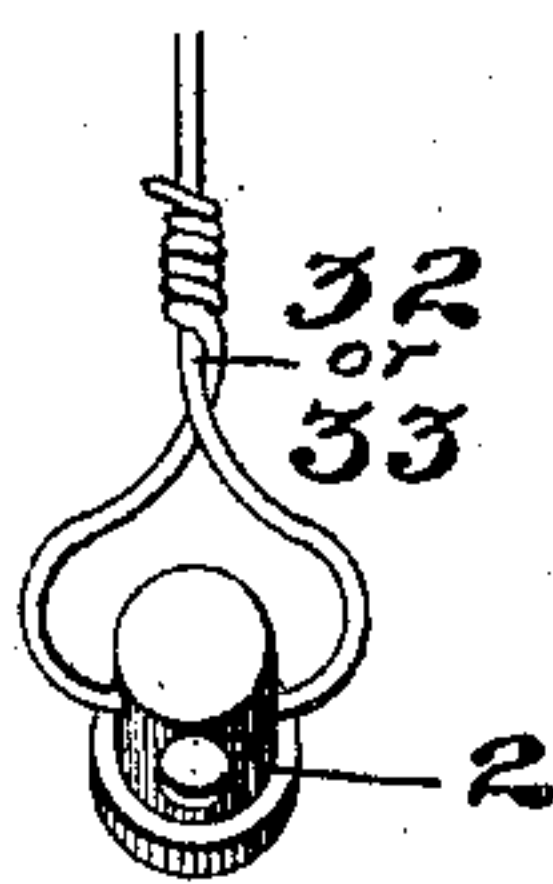
**FIG. IX**



**FIG.VII.**



**FIG. X.**



**WITNESSES:**

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# UNITED STATES PATENT OFFICE.

HARRY ETHERIDGE, OF MCKEESPORT, PENNSYLVANIA.

## LAMP HOOD AND SWITCH.

SPECIFICATION forming part of Letters Patent No. 697,708, dated April 15, 1902.

Application filed July 23, 1901. Serial No. 69,413. (No model.)

*To all whom it may concern:*

Be it known that I, HARRY ETHERIDGE, a subject of Edward VII of Great Britain, residing at McKeesport, in the county of Allegheny and State of Pennsylvania, have invented certain new and useful Improvements in Lamp Hoods and Switches; and I do hereby declare the following to be a full, clear, and exact description thereof, reference being had to the accompanying drawings, which form a part of this specification.

In the present electric-light system considerable trouble is experienced in the lamp-hoods, particularly that class of hoods employed to confine the switch mechanism and wherein the movable member of said switch for diverting the current is actuated by springs, also wherein a wooden "spreader" or cross-arm extends from the hood to secure the leads as they enter and leave the lamp. In this class of lamp-hoods the springs employed to actuate the insulated movable switch member through constant use become weak or broken, thereby preventing the operation of the switch and seriously interfering with the operation of the lamp and circuit. Again, the insulators on the spreader that are employed to secure the leads as they enter and leave the lamp-hood become broken or detached or the connecting screws rust off, causing said leads to hang loose, and thereby placing the strain of the wires upon the switch-terminals, in which condition said leads readily break or their contact with the frame of the lamp causes the lamp to be cut out of circuit, &c. Furthermore, the crystallization of the wires due to constant bending at the point where said wires are tied to the spreader-insulators causes them to break and is a constant source of trouble and expense in the operation of the system.

The object of my invention is to provide means whereby the above and other difficulties in lamp hoods and switches of this particular class are fully overcome.

In order to make my invention thoroughly understood, I have in the accompanying drawings illustrated in several ways my improvements as connected with a lamp and shall after describing the parts in detail take up and set forth the operation and advantages thereof.

In said drawings, Figure I is a vertical side elevation of a lamp having my improved hood and switch connected thereto. Fig. II is another vertical side elevation of a lamp and hood, wherein a transverse section of the hood and switch is removed. Fig. III is a similar view of the upper portion of the lamp and hood at right angles from the former views, also having a transverse section of the hood and switch removed, as at line X X of Fig. I. Fig. IIII is a plan view of the hood in section at line X X of Fig. I to disclose the switch mechanism. Fig. V is an enlarged side elevation of the complete switch mechanism removed from the hood and detached from the lamp. Fig. VI is a vertical view of the movable lever which forms one member of the switch mechanism, the upper portion of which is sectionally shown, as on the line o o of Fig. V. Fig. VII is a perspective view of one of the single contact members of the switch mechanism. Fig. VIII is a perspective view of the other single member. Fig. IX is a similar view of the double contact member. Fig. X is a perspective view of one of the lamp-terminals, showing the preferred manner of connecting the wire thereto.

Further referring to the drawings for a description of the lamp, hood, and switch and such detail parts as may conveniently be combined into a practical and complete apparatus to carry my object into effect, the numeral 1 indicates the lamp; 2, the terminals thereof; 3, a spool composed of insulating material mounted between a pair of upwardly-extended lugs upon the lamp-top, and 4 an elongated link engaging about said spool to suspend the lamp. As this portion of the lamp practically forms but one operating element in the improvements and as the interior construction and operation thereof is well known in the art, the brief allusion thereto will suffice.

As a protection to the lamp I provide a hood 5, having an inclined annular flange 6 extending thereabout at sufficient distant to fully project beyond the lamp-body. This hood has formed upon or secured to the under side of the flange the tubular casings 7, and upon the interior of the hood proper extends the lugs 8, while at the top is arranged a clevis 9, fitted with an insulating-spool 10



to suspend the hood from the mast-arm or other support. Within this hood and secured to the aforesaid lugs is the circular plate of porcelain or other insulating material 11, having formed therethrough the openings 12 and 13. To the under side of this insulating-plate are secured bearings 14, within which is mounted a shaft 15. This shaft has a crank 18 and extension 17, said crank being connected to the aforesaid lamp by preferably an S-shaped hook 16 and said extension provided with a cushion 19, preferably of rubber, to engage at alternate movements of the crank with the edges of said plate-opening 12. One end of this shaft is provided with an arm or crank 20, and upon the opposite end is loosely fitted a switch-lever 21. This switch-lever is provided at its lower end with a transverse slot 22 to engage over a pin 23, rigidly secured in the shaft. The upper end of this switch-lever is provided with plates 24 and 25, which are properly insulated from one another and said lever and have formed thereon curved lips 26 and 27. Plates 28 and 29, each having a pair of upwardly-extended contacts 30 and 31 thereon, spaced sufficient distance from one another to engage the contacts on switch-lever, are attached to the aforesaid insulating-plate 11. These plates are connected to the lamp-terminals 2 by wires 32 and 33. Said wires after passing through the openings in the terminals and securely clamped by the screws thereof are turned backward and twisted upon themselves, so as to have double protection against possibility of a single wire becoming loose in the terminals or breaking thereat.

Tightly fitted or otherwise secured into the tubular casings of the hood are the insulated bushings or tubes 37, each of which has formed upon its upper end a shoulder 38 to engage the end of the casing and the base 11.

The lead-wires 39 and 40 where they enter and leave the lamp are each coiled into a long helix 41 and 42, which are of such diameter as will permit being forced part way and retained in said insulating-bushings. One end of each helix is attached to and permanently soldered within the lips 26 and 27 of the movable switch-lever plates.

As an auxiliary in operating the switch a tool composed of a handle 43 of insulating material, having a shank 44, is employed, as shown at Fig. I.

In the views, Figs. I, II, III, IIII, and V, the switch is shown as closed, with the current passing through the lamp.

To open the switch or divert the current from the lamp the tool-shank is engaged with the switch-crank arm 20 and by hand, with the assistance of the gravitating force of the lamp, forced to a position at the opposite side, as indicated by dotted lines at Fig. I. When the switch has thus been thrown, the plates 24 and 25 of the movable switch member will be disengaged from the contacts 30 and 31 and engaged with the contacts 35 and 36, thereby

cutting the lamp out of circuit and diverting the current through the said last-mentioned contacts, said switch-lever plates being of such length as to engage one set of contacts before leaving the other, thereby preventing arcing and avoiding interruption in the circuit. Again, when the switch has been thrown, as above described, the lamp will, owing to the movement of the crank-shaft, assume a position as illustrated by dotted lines at Fig. I, and at the same time the cushion 19, engaging with the edge of the plate-opening 12, will break the concussion occasioned by the weight of the lamp cooperating with or attending the throwing of the switch, as well as limit the movement of such throw in either direction. During the operation of throwing the switch in either direction the said lever 21 does not break contact until the crank has described an arc of about forty-five degrees from its normal position, as indicated by dotted lines at Fig. V, in which case the crank will have assumed a position over the center, causing the shaft-pin 23 to engage said lever at one end of its slot 22. When the crank-shaft has assumed the above-described position, the gravitating force exerted thereupon by the lamp quickly withdraws the lever-contact from those which it engages and plunges them into those at the opposite side. As the gravitating force of the lamp acting upon the movable switch is considerable, all contact members are adjusted to slide into and fit neatly within one another, thereby avoiding oxidation of the surfaces and insuring perfect contact at the switching-points.

By forming the spirals 41 and 42 upon the lead-wires the bending which such wires are subjected to in elevating and lowering the lamp, &c., is distributed throughout the entire length of the spirals, and as said spirals are possessed of more or less elasticity crystallization, and consequent breakage, is prevented. Again, as these lead-spirals engage within the insulating-bushings of the hood with sufficient force to insure their remaining therein any possibility of strain being imparted to the switch connections is thereby avoided. Furthermore, as the spirals extend some distance beyond the lamp and its hood all danger of the wires coming into contact therewith and cutting out said lamp is avoided. It will also be observed that the switch is entirely inclosed within the hood, thereby making the same absolutely waterproof. Again, the leads being placed in an inclined position where they enter and leave the hood effectually shed the water therefrom.

In connecting the wires 32 and 33 to the lamp-terminals, as illustrated in the several views, additional continuity of the circuit is assured at either side of the terminal-screw should the wire at either side of said screw become broken from any cause.

I have specifically described the construction and relative arrangement of the detail parts contained in a practical apparatus to



effect my object; but I do not confine myself to any particular detail, as equivalents may be collectively arranged to effect the desired results.

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

1. In a hanger for arc-lamps, the combination with a switch having the necessary con-  
10 tacts, of a switch-arm pivoted to oscillate between said contacts, and an arc-lamp supported above and pivoted about the same center whereby the weight thereof operates to move said switch-arm into and retain the same in  
15 either of its operative positions when moved past its central or neutral point.

2. In a hanger for arc-lamps, the combination with a switch having the necessary con-  
20 tacts, of a switch-arm pivoted to oscillate between said contacts, an arc-lamp supported above and pivoted about the same center whereby the weight thereof operates to move said switch-arm into and retain the same in  
25 either of its operative positions when moved past its central or neutral point, and a cushion adapted to take up the shock of said arm when oscillated to its operative position.

3. In a hanger-board for arc-lamps, the combination with a switch having the necessary  
30 contacts, of a switch-arm pivoted to oscillate between said contacts and engage at one side before leaving the other, and an arc-lamp supported above and pivoted about the  
35 same center whereby the weight thereof operates to move said switch-arm into and retain the same in operative position when moved past its central or neutral point.

4. In a hanger-board for arc-lamps, the combination with a switch having the necessary  
40 contacts, of a switch-arm pivoted to oscillate between said contacts, an oscillatable lamp-suspending member operating upon the same center as said arm, and a lamp suspended  
45 from said member above its axis which is adapted by its weight to act upon said member when moved past its central or neutral point in either direction to actuate said arm into and retain the same in operative position.

5. In a hanger-board for arc-lamps, the combination with a switch having the necessary  
50 contacts, of a switch-arm pivoted to oscillate between said contacts, an oscillatable lamp-suspending member operating upon the same center as said arm, a lamp suspended from  
55 said member above its axis which is adapted by its weight to act upon said member when moved past its central or neutral position in either direction and actuate said arm into and  
60 retain the same in operative position, and means to take up the concussion when said arm is moved into said operative position.

6. In a hanger-board for arc-lamps, the combination with a switch having the necessary  
65 contacts, of a switch-arm loosely mounted upon a shaft and adapted to oscillate between said contacts, an oscillatable lamp-suspending member carried by said shaft, a lamp sus-

pended from said member above its axis which is adapted by its weight to move said member in either direction when assisted past its  
70 central or neutral point, and actuate said switch-arm into and retain the same in operative position, and means whereby said switch-arm remains unaffected until said lamp member has been assisted past its neutral point. 75

7. In a hanger-board for arc-lamps, the combination with a switch having the necessary  
contacts, of a switch-arm loosely mounted upon a shaft and adapted to oscillate between  
80 said contacts, an oscillatable lamp-suspending member carried by said shaft, a lamp suspended from said member above its axis which is adapted by its weight to move said member in either direction when assisted past its  
85 central or neutral point and actuate said switch-arm into and retain the same in operative position, means whereby said switch-arm remains unaffected or unmoved until said  
90 lamp member has been assisted past its neutral point, and means to take up the concussion of said arm when moved into operative positions.

8. In a hanger-board for arc-lamps, the combination with a switch having the necessary  
95 contacts, of a switch-arm pivoted to oscillate between said contacts, an arc-lamp pivoted about the same center, whereby the weight thereof operates to move said switch-arm into and retain the same in either of its operative  
100 positions when moved past its central or neutral point, and a crank or equivalent thereof carried by said arm-operating mechanism to operate the lamp past its central or neutral suspension-point.

9. In a hanger-board for arc-lamps, the combination with a switch having the necessary  
105 contacts, of a switch-arm pivoted to oscillate between said contacts, an arc-lamp supported above and pivoted about the same center whereby the weight of said lamp operates to  
110 move said switch-arm into and retain the same in either of its operative positions when moved past its central or neutral point, a cushion adapted to take up the shock of said  
115 arm when oscillated to its operative position, and a crank or the equivalent thereof carried by said arm-operating mechanism to operate the lamp past its neutral point of suspension.

10. In a hanger-board for arc-lamps, the combination with the necessary contacts, of a  
120 switch-arm pivoted to oscillate between said contacts and engage at one side before leaving the other, an arc-lamp supported above and pivoted about the same center, whereby  
125 the weight thereof operates to move said switch-arm into and retain the same in operative position when moved past its central or neutral position, and a crank or the equivalent thereof carried by said arm-operating  
130 mechanism to operate the lamp past its neutral point of suspension.

11. In a hanger-board for arc-lamps, the combination with a switch having the neces-



sary contacts, of a switch-arm pivoted to oscillate between said contacts, an oscillatable lamp-suspending member operating upon the same center as said arm, a lamp suspended from said member above its axis which is adapted by its weight to act upon said member when moved past its central or neutral point in either direction and actuate said arm into and retain the same in operative position, and a crank or the equivalent thereof carried by said arm-operating mechanism to operate said member past its neutral point.

12. In a hanger-board for arc-lamps, the combination with a switch having the necessary contacts, of a switch-arm pivoted to oscillate between said contacts, an oscillatable lamp-suspending member operating upon the same center as said arm, a lamp suspended from said member above its axis which is adapted by its weight to act upon said member when moved past its central or neutral point in either direction and actuate said arm into and retain the same in operative position, means to take up the concussion of said arm when moved into operative positions, and a crank or the equivalent thereof carried by said operating mechanism to operate said member past its neutral point.

13. In a hanger-board for arc-lamps, the combination with a switch having the necessary contacts, of a switch-arm loosely mounted upon a shaft and adapted to oscillate between said contacts, a lamp-suspending member carried by said shaft, a lamp suspended from said member above its axis which is adapted by its weight to move said member in either direction when assisted past its central or neutral point and actuate said switch-arm into and retain the same in operative position, means whereby said arm is unaffected until said lamp member has been assisted past its neutral point, and a crank or the equivalent thereof carried by said shaft to operate said lamp member past its neutral point.

14. In a hanger-board for arc-lamps, the combination with a switch having the necessary contacts, of a switch-arm loosely mounted upon a shaft and adapted to oscillate between said contacts, a lamp-suspending member carried by said shaft, a lamp suspended from said member above its axis which is adapted by its weight to move said member in either direction when assisted past its central or neutral point and actuate said arm into and retain the same in operative position, means whereby said arm is unaffected until said member has been assisted past its neutral point, a crank, or the equivalent thereof carried by said shaft to operate the lamp member past its neutral point, and means to take up the shock when said arm is moved into operative position.

15. A hood, a hanger-board arranged therein carrying switch-contacts, tubular insulators carried by said hood, a helix formed upon each lead-wire circumferentially engaging in

said insulators, a switch-arm pivoted to oscillate between said contacts, and an arc-lamp supported above and pivoted about the same center whereby the weight thereof operates to move said switch-arm into and retain the same in either of its operative positions when said lamp is moved past its central, or neutral suspension-point.

16. A hood, a hanger-board arranged therein carrying switch-contacts, tubular insulators carried by said hood, a helix formed upon each lead-wire circumferentially engaging in said insulators, a switch-arm pivoted to oscillate between said contacts, an arc-lamp supported above and pivoted about the same center whereby the weight thereof operates to move said switch-arm into and retain the same in either of its operative positions when said lamp is moved past its central or neutral suspension-point, and means of reducing concussion when said arm is forced into operative position.

17. A hood, a hanger-board arranged therein carrying switch-contacts, tubular insulators carried by said hood, a helix formed upon each lead-wire circumferentially engaging in said insulators, a switch-arm pivoted to oscillate between said contacts, an arc-lamp supported above and pivoted about the same center whereby the weight thereof operates to move said arm into and retain the same in either of its operative positions when said lamp is moved past its central or neutral suspension-point, means for reducing concussion when said arm is moved to its operative position, and a crank or the equivalent thereof carried by said lamp-support to operate the same past its neutral point.

18. A hood, tubular insulators carried by said hood, a helix formed upon each lead-wire to partly extend and engage in said insulators, a switch inclosed in said hood the movable member of which is provided with a crank, a lamp suspended from said crank whereby the gravitating force thereof will when coöperating with the force employed to move said switch-member crank divert the current and maintain the continuity of the circuit in said diverted path, means of applying the necessary force to said crank to coöperate with said lamp gravity, and means of reducing concussion when the movable contact member is forced to operative position.

19. A hood, tubular insulators carried by said hood, a helix formed upon each lead-wire which partly extend and engage in said insulators, a switch inclosed in said hood the movable member of which is provided with a crank, a lamp suspended from said crank whereby the gravitating force thereof will when coöperating with the force employed to move said switch-member crank divert the current and maintain the continuity of the circuit in said diverted path, means whereby disengagement of the switch members is not effected until the said lamp-gravitating force becomes active, and means of reducing con-



cussion when the movable member is forced to operative position.

20. A hood, tubular insulators carried by said hood, a helix formed upon each lead-  
5 wire to partly extend and engage in said insulators, a switch inclosed in said hood the movable member of which is provided with a crank, a lamp suspended from said crank whereby the gravitating force thereof will  
10 when coöperating with the force employed to move said crank divert the current and maintain the continuity of the circuit in said diverted path, means of applying the necessary force to said crank to coöperate with said  
15 lamp gravity, means whereby the disengagement of the switch members is not effected until said lamp-gravitating force becomes active, and means of reducing the concussion when the movable contact member is forced  
20 to operative position.

21. The combination with a lamp and the leads thereof, of a flanged hood adapted to inclose the lamp-switch, tubular insulators carried by the flange of said hood, and a helix  
25 formed upon each of said lead-wires to adjustably engage in said insulators.

22. The combination with a lamp and the leads thereof, of a hood adapted to inclose the switch and having an annular inclined  
30 flange extending thereabout, tubular insulators secured upon said flange, and a helix formed upon each of said leads to adjustably engage in said insulators.

23. The combination with a lamp and leads thereof, of a hood adapted to cover the switch  
35 mechanism, tubular insulators carried by said hood, and helixes formed upon said leads circumferentially engaging in said insulators.

24. The combination with a lamp and leads thereof, of a hood adapted to inclose and sup-  
40 port the switch mechanism, tubular insulators carried thereby, and helixes formed upon said leads circumferentially engaging in said insulators.

25. The combination with a lamp and the  
45 leads thereof, of a hood adapted to cover the switch mechanism and provided with an annular flange, tubular insulators carried thereby beneath said flange, and helixes formed upon said leads circumferentially engaging  
50 in said insulators.

26. The combination with a lamp and the leads thereof, of a hood adapted to inclose and support the switch mechanism and provided with an annular flange, tubular insulators  
55 carried thereby beneath said flange, and helixes formed upon said leads circumferentially engaging in said insulators.

In testimony whereof I have hereunto affixed my signature in the presence of two sub-  
60 scribing witnesses.

HARRY ETHERIDGE.

Witnesses:

T. CARLISLE MOORE,  
RICHARD S. HARRISON.