

(No Model.)

4 Sheets—Sheet 1.

T. E. ADAMS.
HANGER BOARD FOR ELECTRIC ARC LAMPS.

No. 547,106.

Patented Oct. 1, 1895.

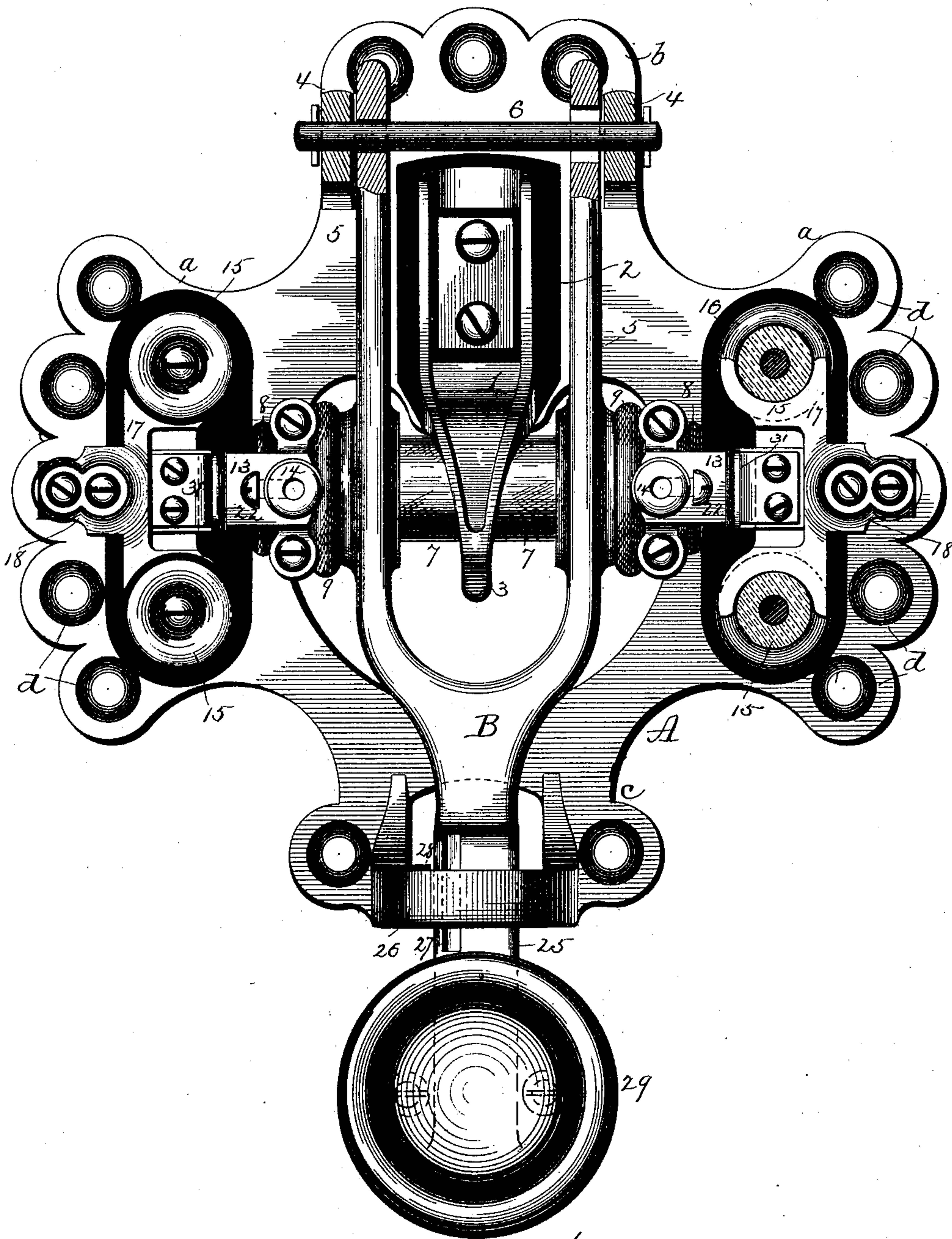


Fig. 1

Witnesses
E. J. Nottingham
G. J. Downing

Inventor
J. E. Adams
By H. A. Seymour
Attorney

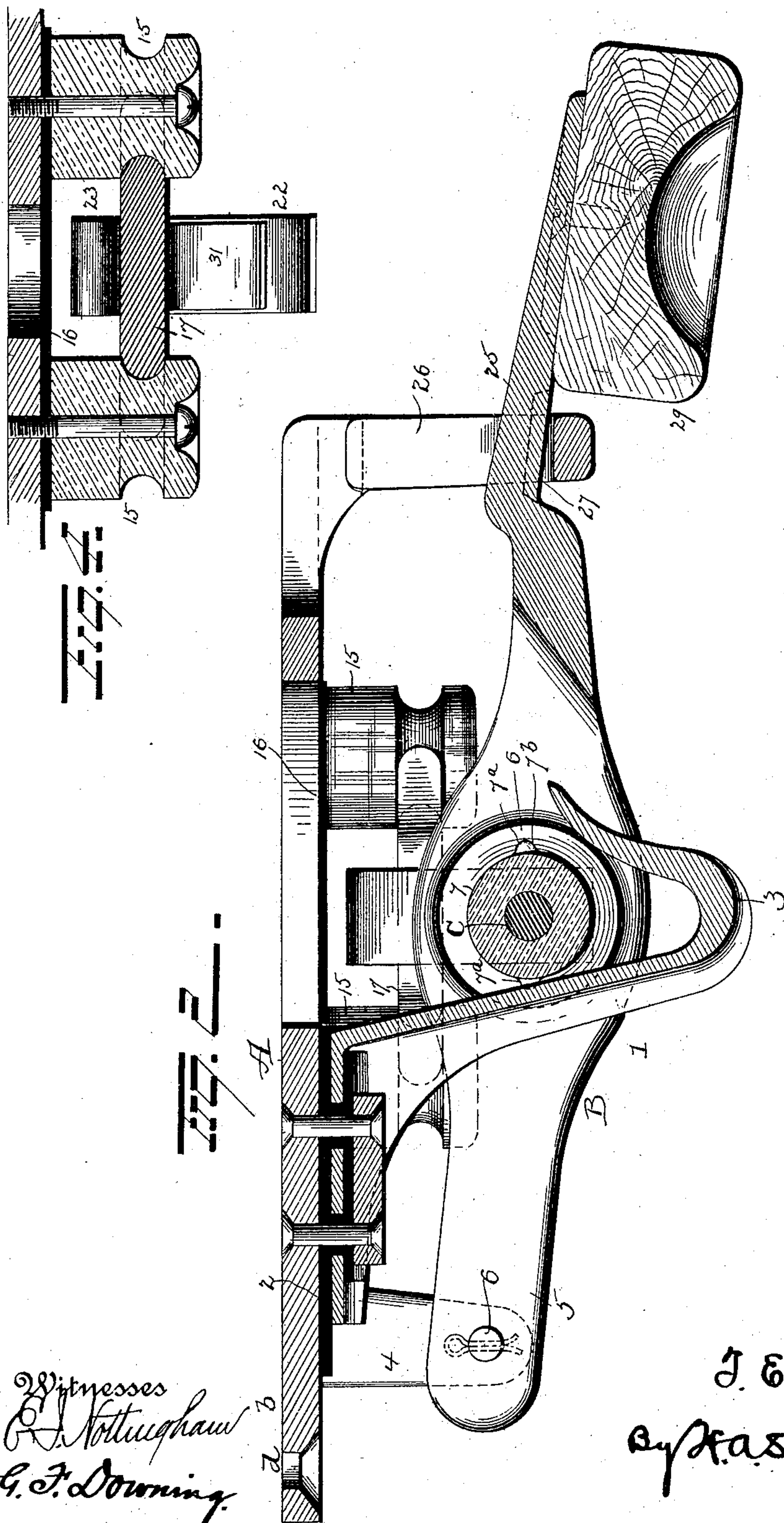
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Attorney

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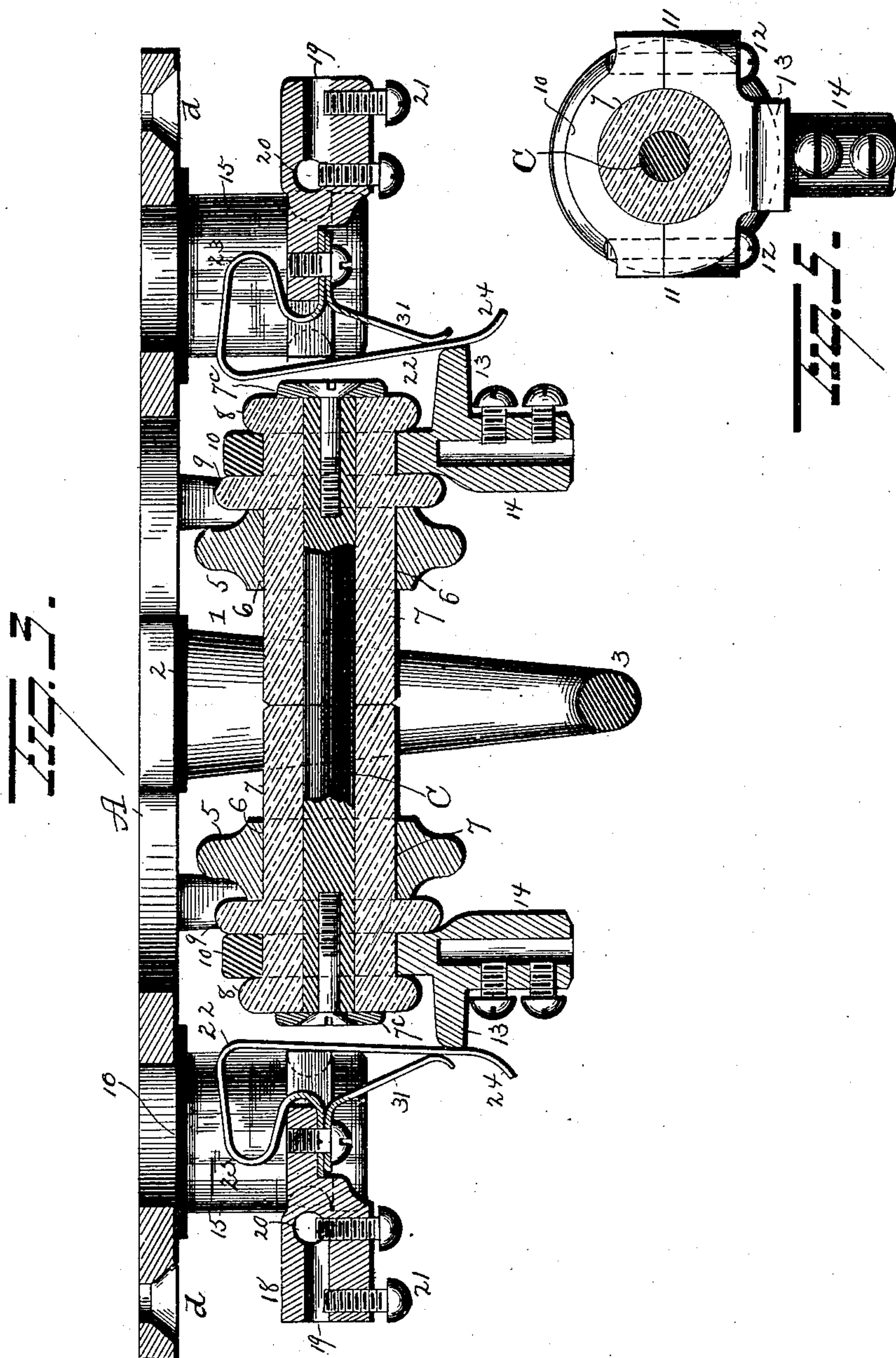
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O. J. Nottingham
G. F. Downing.

Inventor
T. E. Adams
By H. A. Seymour
Attorney

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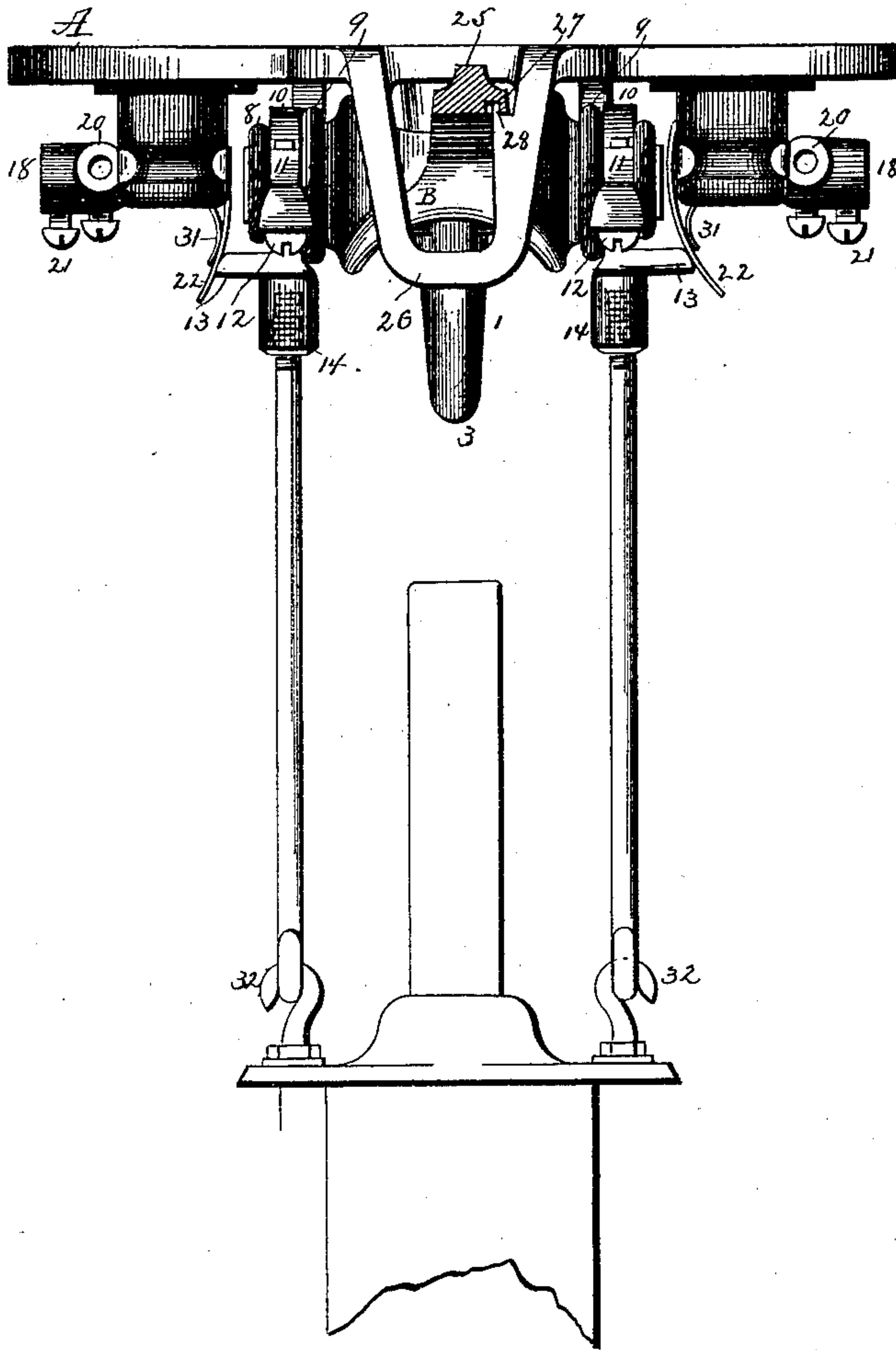


FIG. 6.

Witnesses
C. J. Nottingham
G. F. Downing.

Inventor
T. E. Adams
By H. A. Seymour
Attorney

UNITED STATES PATENT OFFICE.

THOMAS E. ADAMS, OF CLEVELAND, OHIO, ASSIGNOR TO THE ADAMS-BAGNALL ELECTRIC COMPANY, OF SAME PLACE.

HANGER-BOARD FOR ELECTRIC-ARC LAMPS.

SPECIFICATION forming part of Letters Patent No. 547,106, dated October 1, 1895.

Application filed July 17, 1895. Serial No. 556,269. (No model.)

To all whom it may concern:

Be it known that I, THOMAS E. ADAMS, a resident of Cleveland, in the county of Cuyahoga and State of Ohio, have invented certain
5 new and useful Improvements in Hanger-Boards for Electric Lamps; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as
10 it appertains to make and use the same.

My invention relates to an improvement in hanger-boards for electric-arc lamps, and more particularly to such as are adapted for sus-
15 pending series of electric-arc lamps, one object of the invention being to produce a hanger-board which shall be wholly non-combustible.

A further object is to construct a hanger-board in such manner that the lamp will be
20 effectually supported thereby independently of the conductors.

A further object is to provide a hanger-board with ready means whereby to switch
25 the lamp into circuit and to so switch it out of circuit that it will be effectually shut off from all electrical connection with the lamp.

A further object is to so construct the switch devices of a hanger-board that they can be
30 operated by an endwise movement of a pole to either close or open the circuit through the lamp.

A further object is to so construct the switch devices of an arc lamp hanger-board that
35 should the lamp become open-circuited the arcs formed in the switch in consequence of such open-circuiting of the lamp will serve to cause the switch to become closed and the lamp short-circuited.

With these objects in view the invention consists in certain novel features of construc-
40 tion and combinations of parts, as hereinafter set forth, and pointed out in the claims.

In the accompanying drawings, Figure 1 is a bottom plan view of my improved hanger-board. Fig. 2 is a longitudinal sectional view.
45 Fig. 3 is a cross-sectional view. Figs. 4 and 5 are detail views. Fig. 6 is an edge view showing a modification.

A represents a base-plate, of iron or other suitable metal, made preferably with a series
50 of arms *a a b c*, each having perforations *d*

for the accommodation of suitable fastening devices, whereby the hanger can be secured to the ceiling of the room in which the lamp is to be suspended. An arm 1 is secured to the base-plate A and is effectually insulated
55 therefrom by means of mica 2 or other suitable material. The arm 1 depends from the base-plate and terminates in a hook 3 for the reception of a ring or loop on the chimney of the lamp to be suspended. From the arm *b*
60 of the base-plate lugs 4 4 depend, and between these lugs the arms 5 5 of a bifurcated lever B are disposed and to which said arms are pivotally connected by means of a rod 6,
65 which passes through said lugs and arms at points in proximity to their ends. The lever B is normally disposed practically parallel with the base-plate, and between the arms 5 5
70 of the lever the hooked arm 1, by which the lamp is supported, projects. The arms 5 5 of the lever are made between their ends with aligned transverse perforations 6 for the ac-
75 commodation of sleeves 7 7, of porcelain or other suitable insulating material, through which a conducting-bar C passes. To pre-
vent the sleeves 7 from turning, they are provided with ribs 7^a to enter recesses 7^b in the
walls of the perforations 6.

The bar C projects somewhat beyond the outer ends of the insulating-sleeves and is
80 provided at both ends with metallic collars 7^c, whereby to prevent its longitudinal movement in said sleeves. The insulating-sleeves 7 are made at their ends with collars or flanges
85 8 9, between which metallic collars 10 are located, each of said collars 10 being made in two parts, provided with perforated lugs 11 for the reception of screws 12 or other fasten-
90 ing devices. The upper part of each collar 10 is made with a contact-arm 13, which projects laterally beyond the end of the conduct-
ing-bar C, and on each arm 13 a socketed boss or binding-post 14 is cast for the reception of
95 the electric conductors connected with the terminals of the lamp, the conductors being secured in said bosses or binding-posts by
means of screws or otherwise.

Insulators 15, of porcelain or other suitable material, are secured to the arms *a* of the base
A and preferably electrically separated there- 100

from by means of strips 16, of mica or other insulating material. Between each pair of insulators 15 a metallic plate or bar 17 is disposed, its ends being made to enter the grooves of the insulators and bifurcated to partially embrace the same. Each plate or bar 17 is made with an enlargement 18, having holes 19 20, the holes 19 being for the reception of the leading-in wires, which are secured therein by means of screws 21 or in any other suitable manner. The purpose of the holes 20 will be hereinafter explained.

To each plate or bar 17 a contact-spring 22 is secured. The upper ends of the springs 22 at points in proximity to where they are secured to the plates or bars 17 are bent to form loops 23, whereby to impart ample elasticity to them. The contact-springs 22 are made of some length and are adapted when the lever B is in its lowest position to make contact with the ends of the conducting-bar C, and thus short-circuit the lamp and effectually shut the latter off from all electrical connection. The lower ends of the contact-springs are bent outwardly to form curved lips 24, so that when the lever B is moved upwardly the contact-arms 13 will engage said lips and force the springs 22 out of contact with the conducting-bar C, and thus switch the lamp into circuit. The lever B is made with an arm or shank 25, which projects beyond the edge of the base-plate and through a yoke 26, depending from the base-plate, by means of which yoke the downward movement of the lever is limited. The arm or shank 25 is made in its under face with a groove whereby to form a lip 27, adapted when the lever is raised to switch the lamp into circuit to engage a shoulder 28 on the yoke 26 and thus retain the lever in position to maintain the arms 13 in contact with the springs 22. In order to provide ready means for operating the lever to cut the lamp into and out of circuit and avoid danger incident to the use of laterally-movable switch-levers, which are in most cases operated by means of a long pole, I secure to the free end of the arm or shank 25 of the lever B a cup-shaped or dished block 29, of wood or other suitable material, into which the end of a pole can be placed. If it be desired to raise the lever so as to cut the lamp out of circuit, the operator will place the end of a pole in the dished block 29 and push upwardly and slightly laterally, so as to cause the engagement of the lip 27 with the shoulder 28. When the lever is to be lowered, the operator will push upwardly against the dished block, so as to raise the lip 27 off of the shoulder 28, whereupon the lever will be moved laterally by means of one of the contact-springs 22. The removal of the pole will now permit the lever to drop and the lamp will be then switched out of circuit. In order to permit the lateral movement of the lever necessary to cause the engagement of the lip 27 and shoulder 28, the hole in one of the arms 5 of the lever, through which the hinge-pin passes, is made slightly

elongated, and said hinge-pin passes loosely through the hole in the other arm 5. The contact-arms 13 are preferably rounded at their ends, so as to make proper contact with the curved lips on the contact-springs without undue friction, and said contact-springs are so disposed relative to the arms 13 and the conducting-bar that when the lever B is moved in one direction or the other they will make electrical contact with one part before breaking contact with the other part, and thus avoid sparking between said contact-springs, arms, and bar.

From the construction and arrangement of parts above described it will be seen that when the lever B is moved upwardly and the contact-arms 13 force the contact-springs 22 out of contact with the conducting-bar C, so as to switch the lamp into circuit, the air-gap between the springs 22 and the ends of the conducting-bar C will be quite short. Now should there be any defect in the mechanism of the lamp, so that the carbons will not properly feed, and in consequence thereof the lamp shall become "open-circuited," the only path left for the current will be through said air-gaps, and arcs will therefore be found between the contact-springs and the ends of the conducting-bar. The heat from these arcs will act to fuse or soften portions of the springs, but portions only. Said springs being made quite long and being provided near their upper ends with loops, the said upper portions of the springs will maintain their elasticity and the lower fused or softened portions will, by means of such elasticity of the upper portions of the springs, be forced into contact with the conducting-bar C, and the short-circuiting of the lamp will become complete and the arcs above mentioned destroyed. In order to prevent the continuance of the arcs between the contact-springs and conducting-bar for such a length of time as to unduly shorten the contact-springs, so as to render the latter of insufficient length to reach the conducting-bar, and to insure the prompt engagement of the contact-springs with the conducting-bar as soon as the former shall have become sufficiently pliable to bend, I prefer to employ a supplemental spring 31 behind each contact-spring 22 and to so bend the springs 31 that they will tend to force the contact-springs against the conducting-bar. Under ordinary circumstances these supplemental springs may not be found necessary, but they act as safeguards in case of defects in the construction of the device and when the contact-springs are not of proper length. Should the lamp become open-circuited and the contact-springs be rendered defective and useless, as above explained, neither the lamp nor the switch devices can be again operated until they shall have been repaired, and during this operation the hanger-board and lamp must be cut out of circuit. For this purpose the holes 20 in the enlargements 18 are provided for the reception of the ends of a wire-

loop. Thus it will be seen that the mechanism of the lamp can be repaired and the contact-springs 22 replaced by new ones without the necessity of removing either the lamp or the hanger-board.

Some arc lamps are not suspended by means of the chimney, but are provided with hooks 32 on the frame of the lamp and rods connected with these hooks, as shown in Fig. 6. When my improved hanger-board is to be used to support such lamps, the sockets in the bosses or binding-posts 14 may be screw-threaded for the reception of the screw-threaded upper ends of said rods, which latter are electrical conductors.

Numerous slight changes might be made in the details of construction of my invention without departing from the spirit thereof or limiting its scope, and hence I do not wish to limit myself to the precise details of construction herein shown and described; but,

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

1. In a hanger board for electric lamps, the combination with a stationary part and contact springs secured thereto and adapted to be connected with the line, of a movable part, contact arms carried by the movable part and adapted to be electrically connected with the lamp and to engage said contact springs to include the lamp in circuit and a conducting bar carried by the movable part and adapted to be engaged by said contact springs to short circuit the lamp, substantially as set forth.

2. In a hanger board for electric lamps, the combination with a fixed part and a movable part, of contact springs on the fixed part, a short-circuiting conducting bar carried by the movable part and adapted to be engaged by said contact springs, and contact arms carried by the movable part and adapted to be electrically connected with the lamp, said contact arms being constructed and adapted to engage the contact springs and force them out of contact with the short-circuiting conducting bar and include the lamp in circuit substantially as set forth.

3. In a hanger board for electric lamps, the combination with a fixed part and a movable part, of a conducting bar carried by the movable part, contact arms carried by the movable part and projecting beyond the ends of the conducting bar, and contact springs on the stationary part adapted to engage the contact arms and the ends of the conducting bar successively as the movable part is moved, substantially as set forth.

4. In a hanger board for electric lamps, the combination with a stationary part and a movable part, of depending contact springs on the stationary part adapted to be connected with the line, a conducting bar carried by the movable part between said contact springs, contact arms on the movable part projecting beyond the ends of the conducting bar and adapted to force the contact springs away

from the ends of the conducting bar so as to form air gaps between said springs and bar, and means for electrically connecting said contact arms with the lamp, said contact springs being so constructed that should the lamp be open-circuited so that arcs will be formed in said air gaps between the contact springs and conducting bar, the contact springs will fuse or soften at one point and retain sufficient resilience at another point to force themselves into contact with the conducting bar and short-circuit the lamp, substantially as set forth.

5. In a hanger board for electric lamps, the combination with a fixed part and a movable part, contact arms on the movable part, a conducting bar carried by the movable part, plates secured to and insulated from the stationary part and contact springs having loops near their upper ends, secured to said plates and adapted to engage said contact arms and conducting bar, substantially as set forth.

6. In a hanger board for electric lamps, the combination with a fixed part and a movable part, of a conducting bar carried by the movable part, contact arms carried by the movable part, and contact springs secured to the fixed part and adapted to engage said contact arms and conducting bar successively and supplemental springs constructed and adapted to force the contact springs against the conducting bar when portions of said contact springs become fused or softened on account of an arc between them and the conducting bar, substantially as set forth.

7. In a hanger board for electric lamps the combination with a base plate and a lever pivotally connected thereto, of switch devices mounted on said base plate and lever, a yoke through which the end of the lever projects and for which it constitutes a stop to limit its downward movement, and a shoulder on the yoke to be engaged by the lever to retain the latter in its elevated position, substantially as set forth.

8. In a hanger board for electric lamps, the combination with a base plate and a lever pivotally connected thereto so as to have slight lateral play, of switch devices mounted on said base and lever, a yoke through which the lever projects, a lip on the lever and a shoulder at the upper end of the yoke to receive said lip and retain the lever elevated, substantially as set forth.

9. In a hanger board for electric lamps, the combination with a base plate and a lever pivotally connected thereto, of switch devices mounted on said base and lever, means for limiting the downward movement of the lever, means for retaining the lever in its elevated position, and a cup-shaped or dished block secured to the free end of said lever, substantially as set forth.

10. In a hanger board for electric lamps, the combination with a base plate, a lever pivotally connected thereto and insulators arranged in pairs at opposite sides of said lever,

of metallic plates connected between the insulators of each pair, contact springs secured to and depending from said metallic plates, binding posts integral with said metallic plates
 5 for the reception of the line wires, and contact arms carried by the lever and adapted to engage said depending contact springs, substantially as set forth.

11. In a hanger board for electric lamps, the
 10 combination with a base plate and a lever pivotally connected thereto, of insulators secured to the base plate and having grooved walls, plates disposed between said insulators and having bifurcated ends to enter said
 15 grooves, contact springs secured to said plates and depending therefrom and contact devices carried by said lever and adapted to be engaged by said contact springs, substantially as set forth.

20 12. In a hanger board for electric lamps, the combination with a base plate and a bifurcated lever pivotally connected to said base plate, switch devices mounted on said base plate and lever and adapted to be connected
 25 respectively with the line and the lamp, and a hooked arm secured to the base and depending therefrom through said bifurcated lever, substantially as set forth.

13. In a hanger board for electric lamps, the
 30 combination with a base plate and a lever pivotally connected thereto, of insulating sleeves mounted in said lever, a conducting bar passing through said insulating sleeves and contact springs secured to the base plate and
 35 adapted to engage the ends of said bar, substantially as set forth.

14. In a hanger board for electric lamps, the combination with a base plate and a lever pivotally connected thereto, of transverse insulating sleeves carried by said lever, collars
 40 on said sleeves, contact arms projecting from said collars and adapted to be connected with the terminals of the lamp and contact springs on the base plate adapted to engage said contact arms, substantially as set forth.

15. In a hanger board for electric lamps, the combination with a base plate and a lever pivotally connected thereto, of transverse insulating sleeves carried by said lever, metallic collars secured to said sleeves, contact arms
 50 projecting laterally from said collars, binding posts depending from said contact arms for the reception of the conductors to the lamp, and contact springs on the base plate adapted to engage said contact arms, substantially as set forth.

16. In a hanger board for electric lamps, the combination with a base plate and a lever pivotally connected thereto, of transverse insulating sleeves carried by said lever, a conducting bar passing through said sleeves, collars on the outer ends of said insulating sleeves, metallic collars between the insulating collars, contact arms projecting laterally from said metallic collars, and contact springs
 65 on the base plate adapted to engage said contact arms and conducting bar successively, substantially as set forth.

17. In a hanger board for electric lamps, the combination with a base plate and a lever pivotally connected thereto, of contact arms carried by and insulated from the lever, means for electrically connecting said contact arms with the terminals of the lamp, a transverse conducting bar carried by and insulated from the lever, plates secured to and insulated from the base plate, springs secured to said plates and adapted to engage the contact arms and the ends of the conducting bar successively and two binding posts on each
 80 of said insulated plates, one binding post on each plate being for the reception of leading-in wire, and the other binding posts on said plates being for the reception of the ends of a loop wire around the hanger board and lamp, substantially as set forth.

In testimony whereof I have signed this specification in the presence of two subscribing witnesses.

THOMAS E. ADAMS.

Witnesses:

R. S. FERGUSON,
 S. W. FOSTER.