

No. 725,754.

PATENTED APR. 21, 1903.

J. A. MOSHER.
ELECTRIC HEADLIGHT.
APPLICATION FILED JUNE 17, 1902.

NO MODEL.

3 SHEETS—SHEET 1.

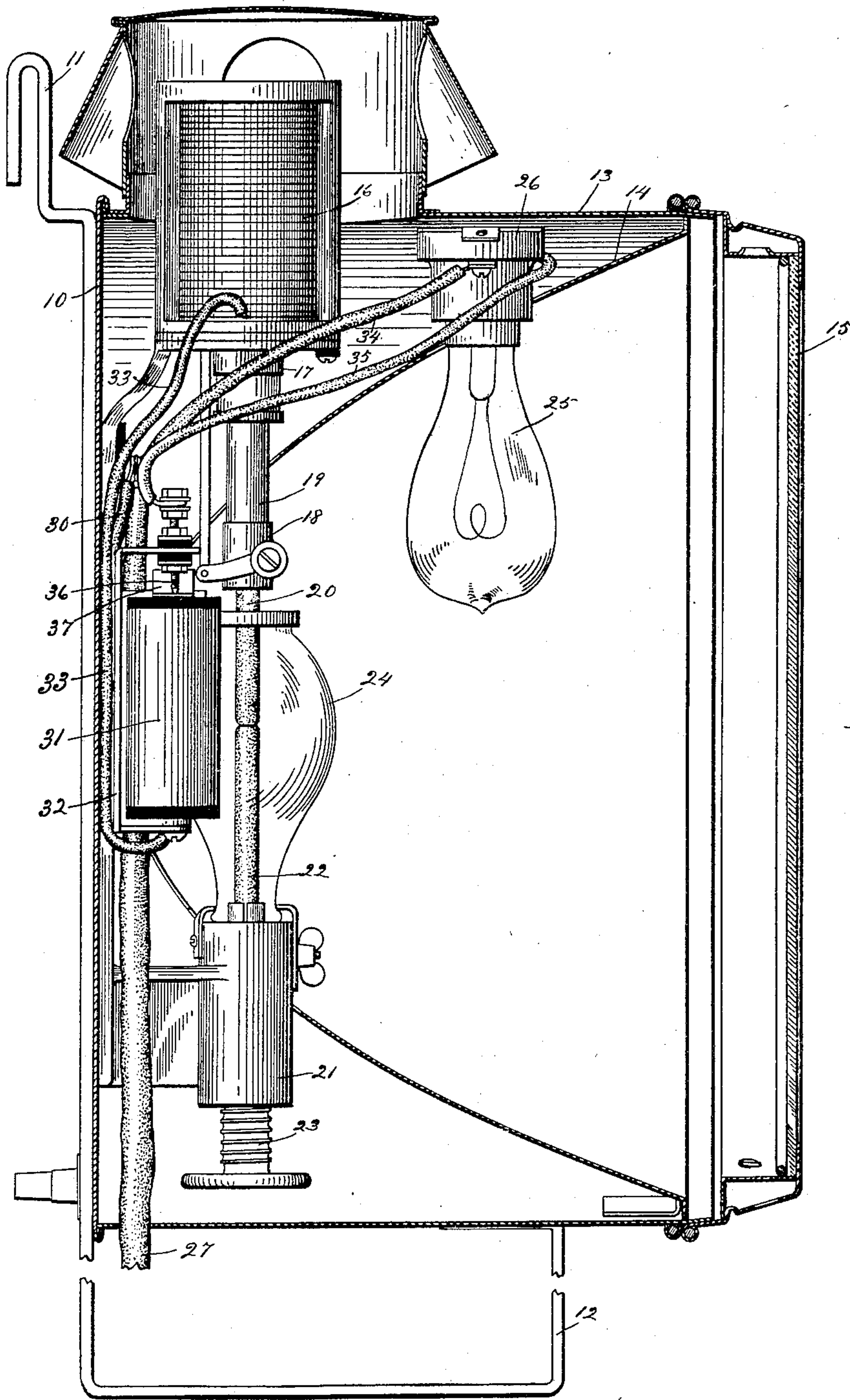


Fig. 1.

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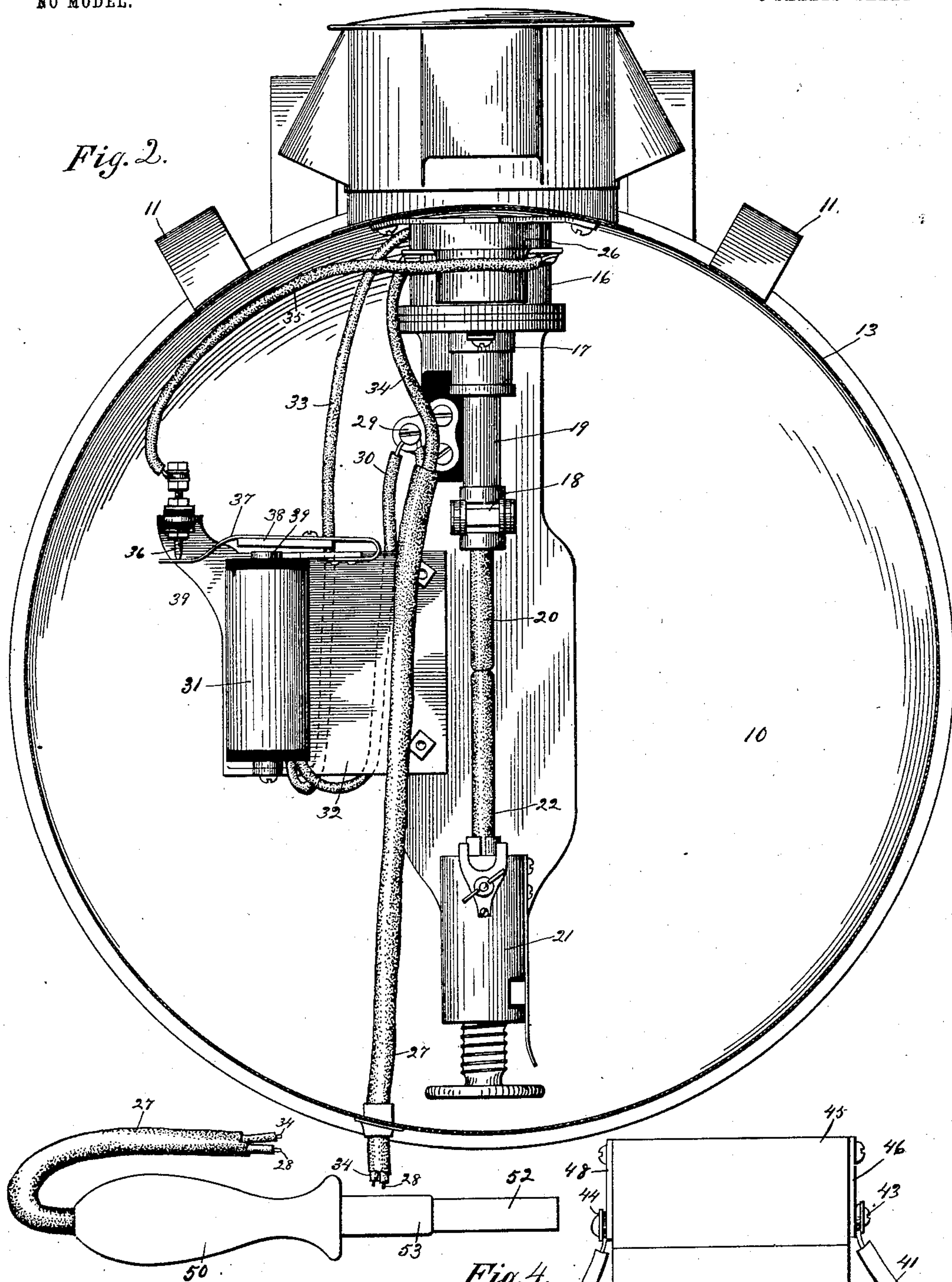
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3 SHEETS—SHEET 2.



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Fig. 4.

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3 SHEETS—SHEET 3.

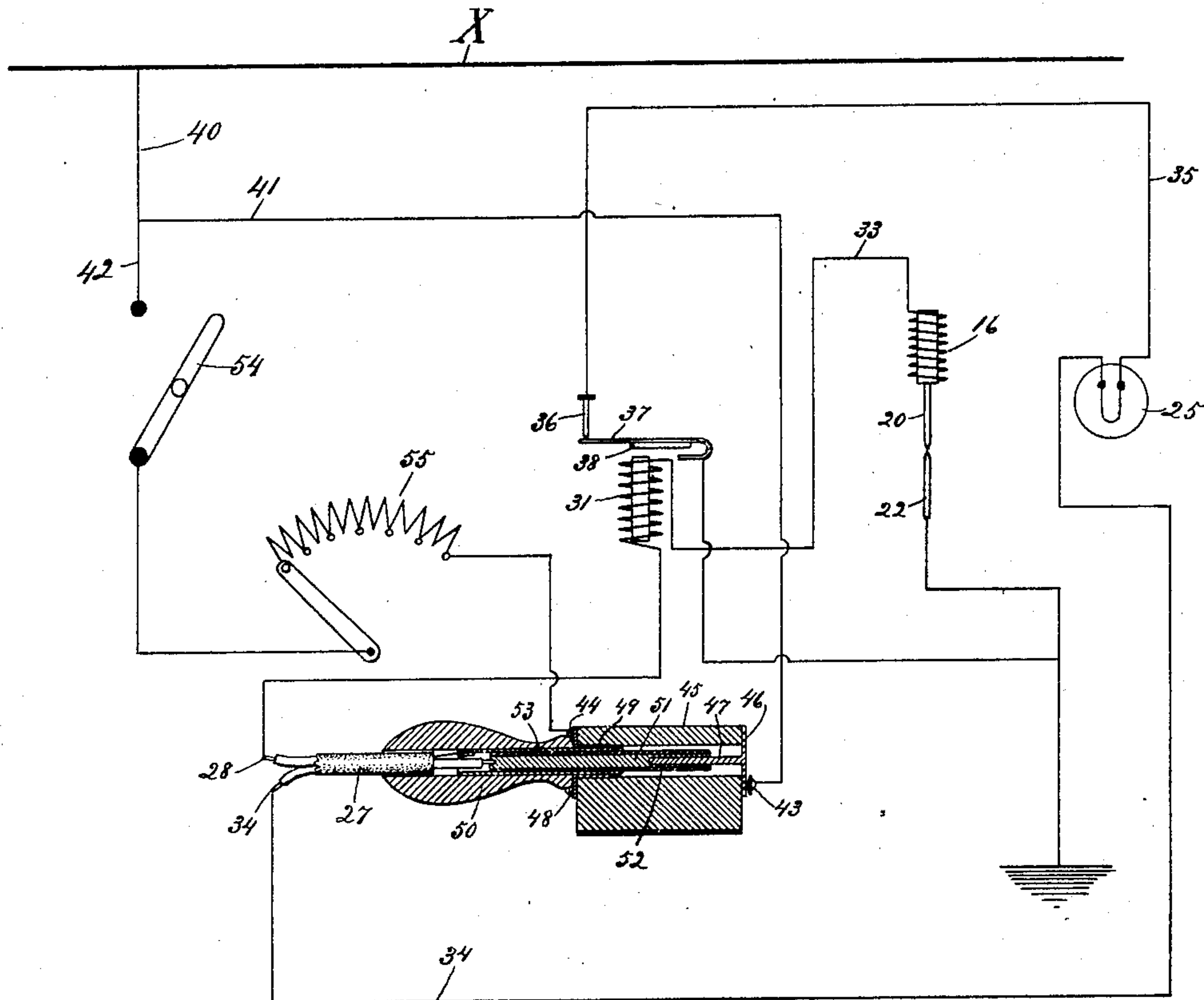


Fig. 3.

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UNITED STATES PATENT OFFICE.

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ELECTRIC HEADLIGHT.

SPECIFICATION forming part of Letters Patent No. 725,754, dated April 21, 1903.

Application filed June 17, 1902. Serial No. 112,056. (No model.)

To all whom it may concern:

Be it known that I, JOHN A. MOSHER, a citizen of the United States, and a resident of Chicago, county of Cook, and State of Illinois, have invented certain new and useful Improvements in Electric Headlights, of which the following is a specification, and which are illustrated in the accompanying drawings, forming a part thereof.

This invention relates to that class of headlights used particularly on trolley-cars, in which there is mounted both an arc and an incandescent lamp for alternate use; and the object of the invention is to provide for the automatic control of one lamp by the circuit of the other. Headlights of this character are of especial value in suburban and inter-urban service, for the reason that outside of the densely-settled portions of a city there is usually very little artificial light provided along the line of railway, and hence a powerful headlight is essential to rapid transit. Within the city, however, a strong light is not only unnecessary, because the streets are usually well lighted, but it is objectionable, because of its glare and consequent risk of so confusing persons crossing the track as to cause instead of hinder accidents.

This invention provides improved and simplified means for manually controlling the lamps; and it furthermore provides for bringing an incandescent lamp immediately into service automatically should any disarrangement of the arc-lamp accidentally cut off its current.

The invention consists in the mechanism hereinafter described, and which is illustrated in the accompanying drawings, in which—

Figure 1 is a longitudinal vertical central section of the headlight. Fig. 2 is a transverse vertical section forward of the lamps and with the reflector, the bulb of the incandescent lamp, and the globe of the arc-lamp removed. Fig. 3 is a diagrammatic view showing the headlight-circuit and including a sectional view of the switch-plug for entirely cutting out the headlight; and Fig. 4 is a detail of this switch-plug, diagram showing also a portion of the circuit.

The body of the headlight is of ordinary form, comprising a back plate 10, a hook 11, by which it may be suspended, feet 12, upon

which it may stand, the casing 13, projecting forwardly from the back plate 10 and in this instance being cylindrical in form, a parabolic reflector 14, housed within the casing, and glass front 15. The arc-lamp is housed within the casing back of the reflector, so that its carbon-holders may project through suitable apertures in the latter, and this lamp comprises the solenoid 16 for controlling the feed, the solenoid-core 17, the upper-carbon-holder mechanism carried by the solenoid, comprising the clutch mechanism 18 and the tube 19, the upper carbon 20, the lower-carbon-holder bracket 21, the lower carbon 22, the lower-carbon holder 23, and the arc-globe 24. This arc-lamp may of course take any desired form. The lamp shown is substantially that of Letters Patent No. 685,426, granted to me October 29, 1901. The incandescent lamp is secured within the casing and at the top thereof forward of the arc-lamp in such position that its bulb projects through a suitable aperture in the reflector 14. This lamp, as usual, comprises the bulb 25 and the socket-block 26. The circuits of both lamps enter the headlight-casing through a cable 27, the wire 28, through which the arc-lamp is supplied with current, being secured to a binding-post 29, carried by a bracket secured to a part of the frame of the lamp, so as to afford a firm anchorage for the circuit. A wire 30 leads from the same binding-post to the coil of an electromagnet 31, carried by a bracket 32, secured to the frame of the lamp, and a wire 33 leads from the coil of this magnet to the coil of the feed-controlling solenoid, which in turn is in circuit with the carbons of the lamp, the lower carbon being grounded in the lamp-frame. Current is supplied to the incandescent lamp through a wire 34, and the opposite terminal of this lamp is grounded through a wire 35, leading to a binding-post, having a contact-point 36 in the path of a spring-plate 37, secured to the bracket 32, and carrying an armature 38, which lies in the field of the pole 39 of the electromagnet 31, the spring 37 being by its tension normally in contact with the point 36.

A trolley-wire is shown at X, and from this wire current is taken through the wire 40, which is divided into the branches 41 and

42, which lead, respectively, to binding-posts 43 44, secured to a socket-block 45, which may be mounted at any convenient point in the car upon which the headlight is to be installed for service where it may be within the convenient reach of the motorman. A plate 46, electrically connected with the binding-post 43, carries a post 47, which rises centrally from the bottom of the socket of the block 45. A plate 48, electrically connected with the binding-post 44, is attached to the opposite end of the block 45 and apertured to correspond with the socket and is provided with a flange 49, which extends within this socket as a bushing. A plug 50 coöperates with the socket-block 45 and is provided with a central stem 51, socketed from its end to receive and make electric contact with the post 47, this stem being inclosed within an insulating-sleeve 52, which in turn is provided with a conducting-sleeve 53, which makes contact with the bushing 49. The cable 27 leads from the handle of the plug 50, and the wire 34, contained in this cable, is in electric contact with the stem 51, the wire 28 being in electric contact with the sleeve 53.

A simple circuit-breaking switch 54 is incorporated in the branch 42, as is also a rheostat 55.

The operation of the headlight is as follows: Each car is of course provided with a socket-block 45 and each headlight with a plug 50. The headlight being attached to the car, it is brought into the circuit 40, which, it will be understood, represents in actual practice the trolley-pole, by the insertion of the plug 50 into the socket of the block 45, and when this connection is made and so long as the trolley-pole is in contact with the wire X one of the lamps of the headlight is in action, as shown in diagram in Fig. 3, and the current is led through the incandescent lamp. Should the switch 54 be closed, the current will be led through the branch 42 and the wire 28 to the arc-lamp, and the electromagnet 31 being energized the armature 38 is attracted and the contact-spring 37 separated from the contact-point 36, thus cutting out the incandescent lamp and permitting all of the current to pass through the arc-lamp. The switch 54 will be located at any convenient point upon the car within the easy reach of the motorman and may be of any desired form. The plug 50 will be used only in the initial turning on of the current to the headlight and in finally cutting it out. In effecting the change from one lamp to the other the operator has merely to throw the switch 54, and should any disarrangement of the arc-lamp occur, a not improbable contingency in view of the constant and severe jarring to which the lamp is subjected, whereby its current is interrupted, the circuit of the incandescent lamp will be instantly automatically closed by the action of the spring 37.

I claim as my invention—

1. In a headlight, in combination, an arc-

lamp and an incandescent lamp having independent circuits, a circuit-breaker in the circuit of one of the lamps, an electromagnet in the circuit of the other lamp and controlling such breaker, and a manually-controlled switch for each circuit, such switches being connected so as to act simultaneously and similarly.

2. In a headlight, in combination, an arc-lamp and an incandescent lamp having independent circuits, a normally closed circuit-breaker in the circuit of one of the lamps, an electromagnet in the circuit of the other lamp and acting in opposition to the means for closing the circuit-breaker, and a manually-controlled switch for each circuit, such switches being connected so as to act simultaneously and similarly.

3. In a headlight, in combination, an arc-lamp, an incandescent lamp, a circuit for each lamp, an electromagnet in series with the arc-lamp and having a vibrating spring-retracted armature, a grounding-terminal in the circuit of the incandescent lamp located to receive and make electrical connection with the armature on its recession, and a manually-controlled switch for each circuit, such switches being connected so as to act simultaneously and similarly.

4. In a headlight, in combination, an arc-lamp and an incandescent lamp having independent circuits, a circuit-breaker in the circuit of one of the lamps, an electromagnet in the circuit of the other lamp and controlling such breaker, a single circuit-closing switch controlling the circuits of both lamps, and a manually-controlled switch for each circuit, such switches being connected so as to act simultaneously and similarly.

5. In a headlight, in combination, an arc-lamp, an incandescent lamp, an electric conductor for connection with a source of current-supply, a branch leading from such conductor through each lamp, a switch in the branch leading through the arc-lamp, an electromagnet in the same branch, a spring-closed circuit-breaker in the circuit of the incandescent lamp, the movable member of such breaker being the armature of the electromagnet.

6. In a headlight, in combination, an arc-lamp, an incandescent lamp, an electric conductor for connection with a source of current-supply, a branch leading from such conductor through each lamp, a manually-controlled switch for each branch, such switches being connected so as to act simultaneously and similarly, a second switch in the branch leading through the arc-lamp, an electromagnet in the same branch, a spring-closed circuit-breaker in the circuit of the incandescent lamp, the movable member of such breaker being the armature of the electromagnet.

7. In a headlight, in combination, a suitable reflector, an arc-lamp and an incandescent lamp located within the reflector and having independent circuits, a normally closed cir-

cuit-breaker in the circuit of one of the lamps, an electromagnet in the circuit of the other lamp for opening the circuit-breaker, a manually-controlled switch acting simultaneously and similarly upon both circuits, a manually-controlled switch for each circuit, such switches being connected so as to act simultaneously and similarly, and a manually-controlled circuit-breaker in the circuit provided with an electromagnet, such circuit-breaker being independent of the other circuit.

8. In combination, an electric circuit, a normally closed circuit-breaker in said circuit, an electromagnet controlling the circuit-breaker, a second electric circuit in series with the electromagnet, and a manually-controlled switch in the last-named circuit and independent of the first-named circuit.

9. In combination, a socketed switch-block, a plurality of electric circuits each having a terminal entering the socket of the block, a

plug adapted to enter such socket and carrying terminal of each circuit arranged for simultaneous contact upon the insertion of the plug into the socket with the terminals secured to the block.

10. In combination, a socketed block, a contact-piece secured to the piece at one end of the socket, a contact-point fixed within the socket, a plug adapted to enter the socket and having an external and an internal contact-piece for engagement respectively with the contact-pieces of the block, and two electric circuits each having a terminal connected with one of the contact-pieces of the block and a terminal connected with one of the contact pieces of the plug.

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Witnesses:

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