

No. 616,770.

Patented Dec. 27, 1898.

C. S. COLE & J. H. KINSMAN.

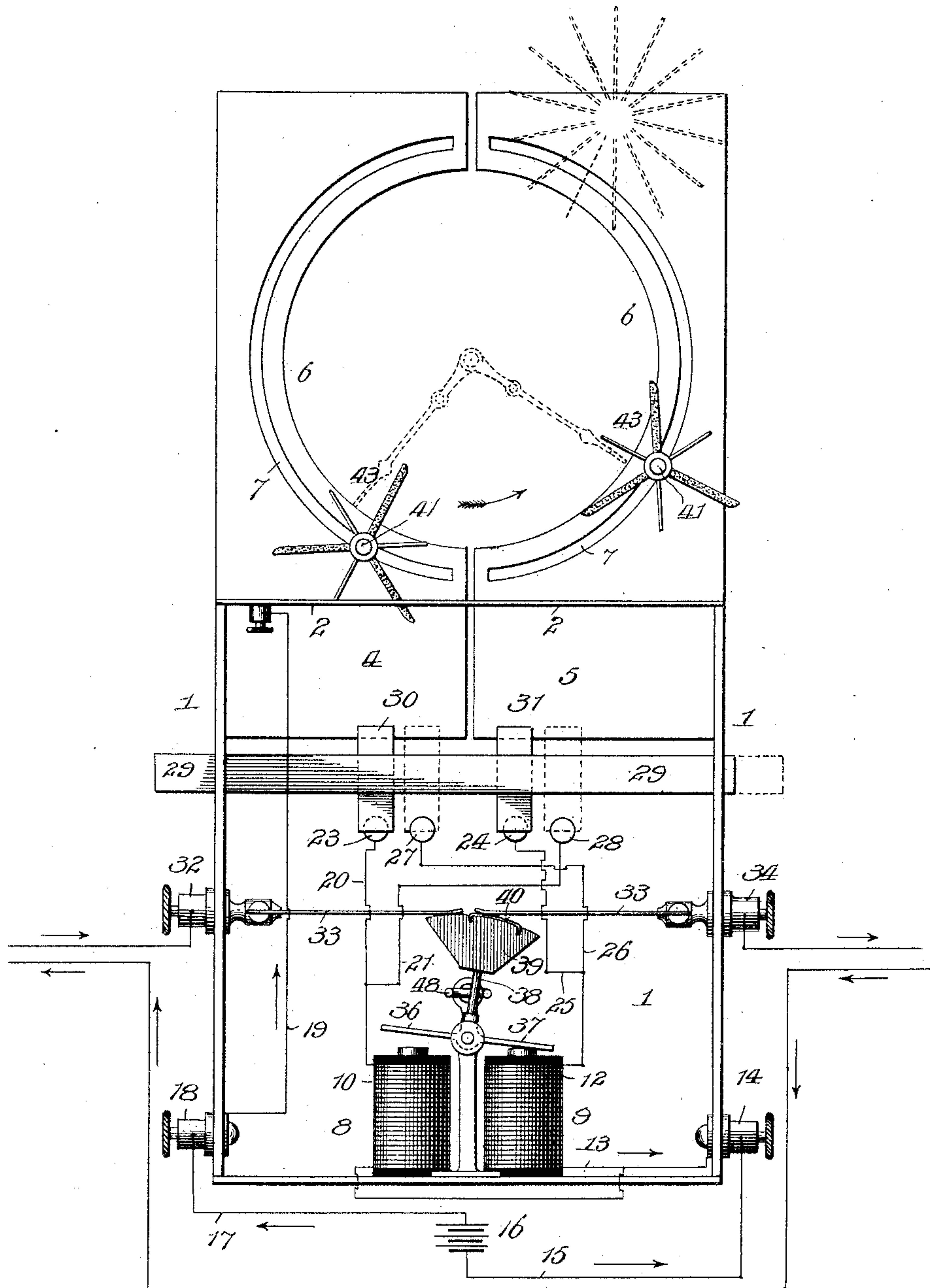
LIGHTING OR EXTINGUISHING AUTOMATICALLY INCANDESCENT ELECTRIC LAMPS.

(Application filed Apr. 1, 1898.)

(No Model.)

2 Sheets—Sheet 1.

Fig. 1.



WITNESSES

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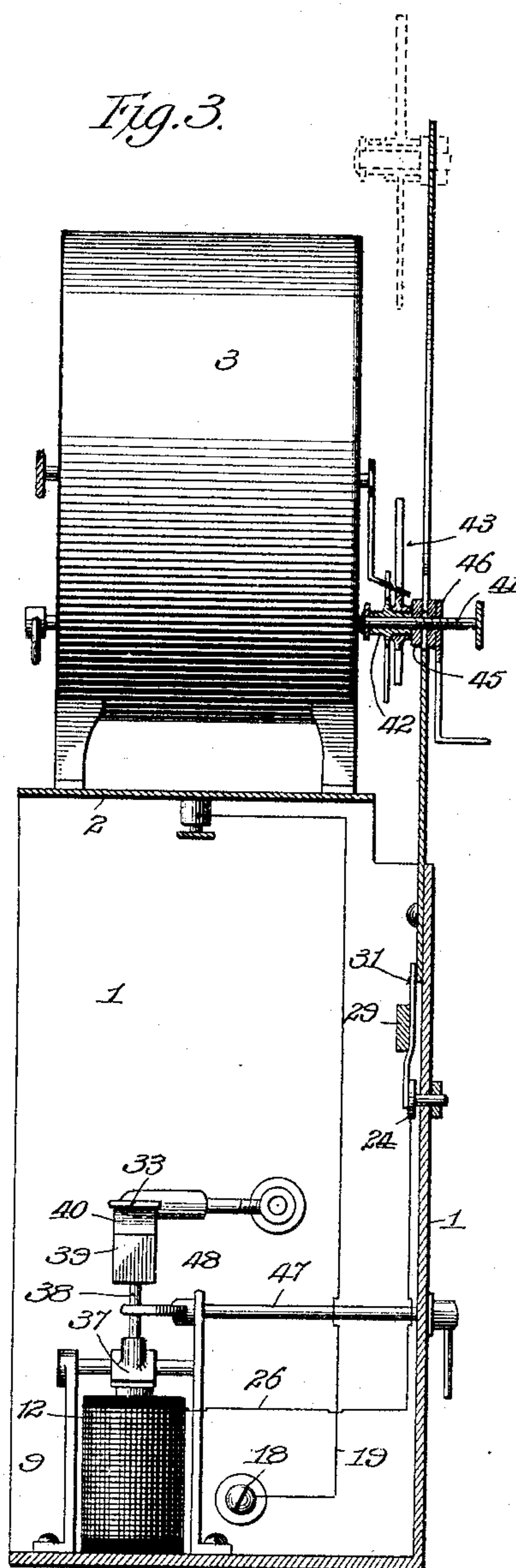
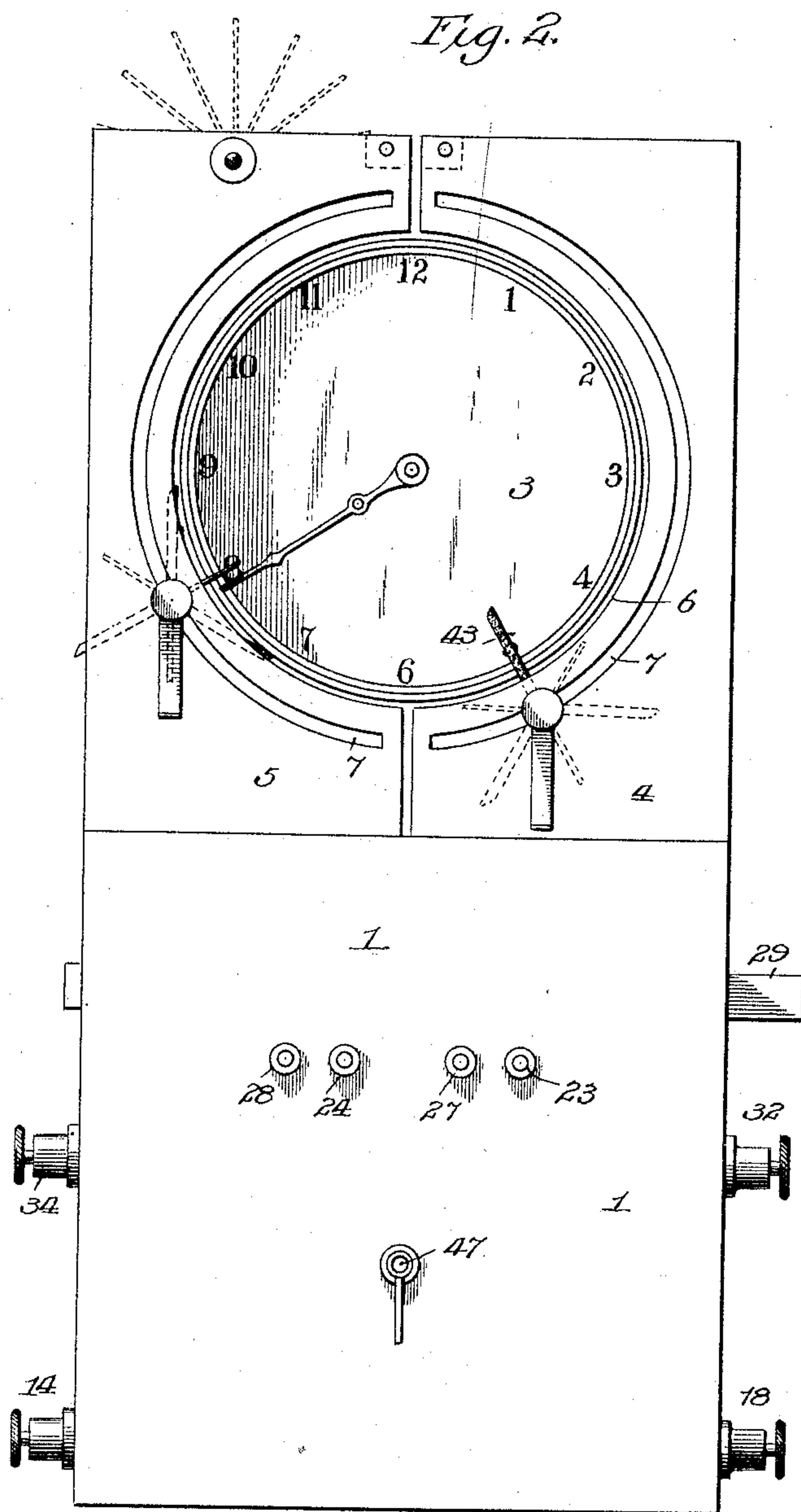
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LIGHTING OR EXTINGUISHING AUTOMATICALLY INCANDESCENT ELECTRIC LAMPS.

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(No Model.)

2 Sheets—Sheet 2.



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UNITED STATES PATENT OFFICE.

CHARLES S. COLE AND JOHN H. KINSMAN, OF BRIDGEPORT, CONNECTICUT.

LIGHTING OR EXTINGUISHING AUTOMATICALLY INCANDESCENT ELECTRIC LAMPS.

SPECIFICATION forming part of Letters Patent No. 616,770, dated December 27, 1898.

Application filed April 1, 1898. Serial No. 676,077. (No model.)

To all whom it may concern:

Be it known that we, CHARLES S. COLE and JOHN H. KINSMAN, citizens of the United States, residing at Bridgeport, in the county of Fairfield and State of Connecticut, have invented certain new and useful Improvements in Lighting or Extinguishing Automatically Incandescent Electric Lamps; and we do declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same, reference being had to the accompanying drawings, and to the figures of reference marked thereon, which form a part of this specification.

Our invention relates to mechanism for turning on and shutting off incandescent electric lights at any predetermined time in stores or other places in which a light or lights are kept burning during the night. It is the usual practice to turn on the light in closing the store in the evening and shut it off in opening up in the morning. This is frequently a source of waste, especially in summer, as the lights are kept burning much longer than necessary, owing to the shortness of the nights.

The object of our invention is to provide improved means whereby the lights will be automatically turned on and cut off at any desired time.

The invention consists in the novel construction and combination of parts hereinafter fully described and claimed.

In the accompanying drawings, Figure 1 is a rear view of an apparatus constructed in accordance with our invention, the clock being removed. Fig. 2 is a detail front view, the clock being in place. Fig. 3 is a transverse sectional view.

In the said drawings the reference-numeral 1 designates a wooden or other non-conducting casing, the top of which consists of a metal conducting-plate 2, upon which the clock 3 rests. This clock may be what is known as the "Waterbury" or other metal clock. If the clock is not of metal, the works must be electrically connected with the conducting-plate 2. Secured to the inner side of the front of the casing are two metal conducting-plates 4 and 5, having upward extensions

formed with semicircular recesses 6 in the inner sides. These plates are separate and distinct from each other, and the clock sits between said recesses with the dial. The plate upon which the clock rests is located far enough back from the upright metal plates to be out of contact with them and to allow the adjustable contacts to revolve without touching them. In rear of said recesses are semicircular slots 7, in which are located rotatable contacts, which by the engagement therewith of the hour-hand of the clock make and break an electric circuit which controls the lamp or light circuit, as hereinafter described. These contacts can be freely moved in the semicircular slots and are retained in any desired position by a flange and thumb-screw. The plates 4 and 5 are each made of two pieces hinged together a short distance above the wooden front in order that either side may be turned down whenever it is desirable that one or both of the revolving contacts should not be actuated by the hour-hand. Another rotatable contact is placed in a fixed position in the upper portion of one of the upright plates from which it is insulated. It is also actuated by the hour-hand. This contact has only one conducting-arm, the others being of non-conducting material. Its use is to cause a bell to ring to call attention to the fact that the clock should be wound. The number of arms is equal to the frequency with which it is desired to wind it. It is in electrical connection with the local battery and the bell, (not shown,) which may be placed wherever convenient.

Located on the bottom of the casing are two independent electromagnets 8 and 9, the coils 10 and 12 of which are connected as one with a conductor 13, leading to binding-post 14. This binding-post is connected by a conductor 15 with an electric battery 16. The other pole of the battery is connected by conductor 17 with a binding-post 18, which in turn is connected by conductor 19 with the conducting-plate 2 at the upper end of the casing. The other end of the magnet-coil 10 is connected by means of conductors 20 and 21 with contact-blocks 23 and 28, respectively, secured to the front of the casing. The other end of the magnet-coil 12 is connected by con-

ductors 25 and 26 with contact-blocks 24 and 27, respectively, in line with and similar to blocks 23 and 28.

The numeral 29 designates a switch consisting of a rectangular non-conducting bar located in a groove in the front of the casing and adapted to slide horizontally therein. This bar is provided with two contact-strips 30 and 31, the upper ends of which contact, respectively, with the plates 4 and 5, while the lower ends are adapted to contact with blocks 23 and 24 or 27 and 28, as the case may be.

The numerals 32 and 34 designate binding-posts at opposite sides of the casing, each of which is provided with an inwardly-extending conducting-strip 33. These strips almost, but do not, meet at the center of the casing, and are pivotally connected with the binding-posts, and are in electrical connection with an electric-light circuit.

Located centrally above the electromagnets is a rocking or oscillating balanced armature comprising the arms 36 and 37 and an upwardly-extending arm 38, provided at its upper end with a non-conducting segment 39, having on its upper side a metallic strip 40, by which the circuit between the strips 33 is made and broken. This armature is so balanced that when one of the arms 36 or 37 is depressed by the attraction of either of the magnets and the current broken it will remain in such position until the other magnet is energized, when it will be attracted thereby and its position reversed.

The numeral 41 designates screw-threaded pins passing through the slots in plates 4 and 5, on which are journaled tubes 42, provided with alternately-arranged long non-conducting and short conducting arms 43. A fixed washer 45 and a movable screw-nut 46 hold these pins in their adjusted positions.

The numeral 47 designates a rotatable rod passing through the front of the casing and provided with arms 48, by which the armature can be rotated by hand if desired to turn on and shut off the light.

The operation is as follows, looking from behind, which of course reverses apparently the motion of the hand: Supposing the hour-hand to be at twelve m., or noon, and it is desired to have the light turned on at five o'clock in the evening and shut off at eight o'clock in the morning, then the rotatable contact at the left of the apparatus, as seen in Fig. 1, which represents the second revolution of the hand, as hereinafter described, is adjusted so as to come opposite the figure "5" on the dial, and one of the conducting-arms thereof is turned so that it will lie in the path of the hour-hand of the clock. The other rotatable contact is adjusted so as to come opposite the figure "8" on the dial; but one of the non-conducting arms will lie in the path of the hour-hand. As the hour-hand moves it will come in contact with the con-

ducting-arm of the contact at the left, when an electric circuit will be established, turning on the light. The circuit is as follows: from battery by conductor 17 to binding-post 18, conductor 19 to plate 2, through the clock and hour-hand to the rotatable contact engaging therewith, to plate 4, conducting-strip 30, contact-block 23, conductor 20 to electromagnet 8, energizing the same, and by conductor 13, binding-post 14, and conductor 15 back to battery. As the electromagnet is thus energized it will attract arm 36 of the rocking armature, causing the conducting-strip to connect the plates, making the lamp-circuit and lighting the lamp. As the hour-hand continues its movement it will turn the rotatable contact until it passes out of engagement with the conducting-arm, when the current will be broken and one of the non-conducting arms be brought into position occupied by the conducting-arm, as shown to the left in Fig. 1. The hour-hand will then come in contact with the non-conducting arm of the rotatable contact at the right, turning said contact so that one of the conducting-arms will be in position to be engaged by the hand when it comes around again to said contact at the time for cutting off the light, as shown to the right in Fig. 1. When the hour-hand again comes into contact at the left or at the figure "5," it will engage with the non-conducting arm thereof, as shown to the left in Fig. 1, turning the rotatable contact so as to put a conducting-arm in a position for use when it is again time for the light to be put on. Passing on the hand reaches the metallic contact at the right, or figure "8," forming connection with the conducting-arm, as shown at the right in Fig. 1, and a new circuit will be established as follows: from battery to binding-post 18, conductor 19, plate 2, the clock and hour-hand, the rotatable contact at the right, plate 5, strip 31, block 24, conductor 25, electromagnet 12, conductor 13, binding-post 14, and conductor 15 back to battery. This will cause the magnet to be energized, attracting arm 37 of the armature, throwing the segment 39 and strip 40 back to normal position, and breaking the circuit between the conducting-strips and turning off the light. When the lamps or lights are to be turned on at, say, eight o'clock in the evening and shut off at, say, five o'clock in the morning, the operation will be the same, except that the rotatable contact at the left will have a non-conducting arm turned in position to be engaged by the hour-hand, while the contact at the right will have a conducting-arm in line with the hand. The positions of the two contacts will thus be reversed with respect to the conducting and non-conducting arms. It will also in this case be necessary to move the switch so as to bring the contacts 30 and 31, respectively, into contact with the blocks 27 and 28, as seen in dotted lines, so that the first circuit will be through

plate 5 and coil 10 instead of through plate 4 and said coil 10, as first described.

Having thus fully described our invention, what we claim is—

1. In a mechanism of the character described, the combination with a non-conducting casing, of a conducting-plate 2 at the top of the casing adapted to support a clock, two independent conducting-plates projecting upwardly from the casing and having semicircular recesses and semicircular slots, rotatable contacts adapted to be turned by the hand of the clock and adjustably secured in said slots and having alternate conducting and non-conducting arms, a switch transversely arranged below said independent conducting-plates and comprising a non-conducting bar and conducting-strips adapted to contact respectively one with each of said independent plates, two pairs of contact-blocks with which said conducting-strips also contact, to electrically connect said blocks with the conducting-plates of the casing, independent electromagnets connected by conductors with said blocks, a battery, and an electric circuit for each pair of contact-blocks, said circuits including the conducting-plate 2 and the clock, a balanced armature, and means carried thereby for making and breaking the light-circuit.

2. In a mechanism of the character described, the combination with the non-conducting casing of the plate 2, a metallic clock supported thereon, the slotted conducting-plates, the adjustable rotatable contacts having alternate conducting and non-conducting arms, and adapted to be struck by the hand of the clock, a switch comprising a non-conducting bar and conducting-strips 30 and 31, two pairs of contact-blocks each pair having its own electric circuit including the plate 2, the clock and one of the slotted plates, an electromagnet in each of said circuits a balanced armature pivotally supported between the magnets and carrying a non-conducting segment, provided with a conducting-strip, and separated conducting-strips in the light-cir-

cuit adapted to be electrically connected by the strip carried by said segment.

3. In a mechanism of the character described, the combination with the non-conducting casing of the conducting-plate 2, a metallic clock supported thereon, the slotted conducting-plates, the rotatable adjustable contacts, the transversely-arranged switch, carrying conducting-strips, the pairs of contact-blocks, the electromagnets, and the electric circuits including the plate 2 and the clock, the balanced armature carrying an arm and a non-conducting segment provided with a conducting-strip, oppositely-extending separated conducting-strips in the light-circuit and a rod extending through the front of the casing and forked at its inner end to engage the arm which projects upwardly from the armature.

4. In a mechanism of the character described, the combination with the non-conducting casing, the conducting-plate 2 at the upper end thereof, the clock located thereon, the conducting-plates having semicircular recesses and semicircular slots, adjustable rotatable contacts located in said slots and provided with alternate conducting and non-conducting arms, a battery in circuit with the plate 2 and the clock, a transversely-arranged switch, provided with contact-strips 30 and 31, the contact-blocks, the independent electromagnets, the coils of which are connected with said contact-blocks and with the battery, the balanced rocking armature, a segment carried by the armature and provided with a contact-strip, and the separated conducting-strips in circuit with an electric lamp, substantially as described.

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

CHARLES S. COLE.
JOHN H. KINSMAN.

Witnesses:

WILLIAM LOUNSBURY,
CHARLES H. SHANNON.